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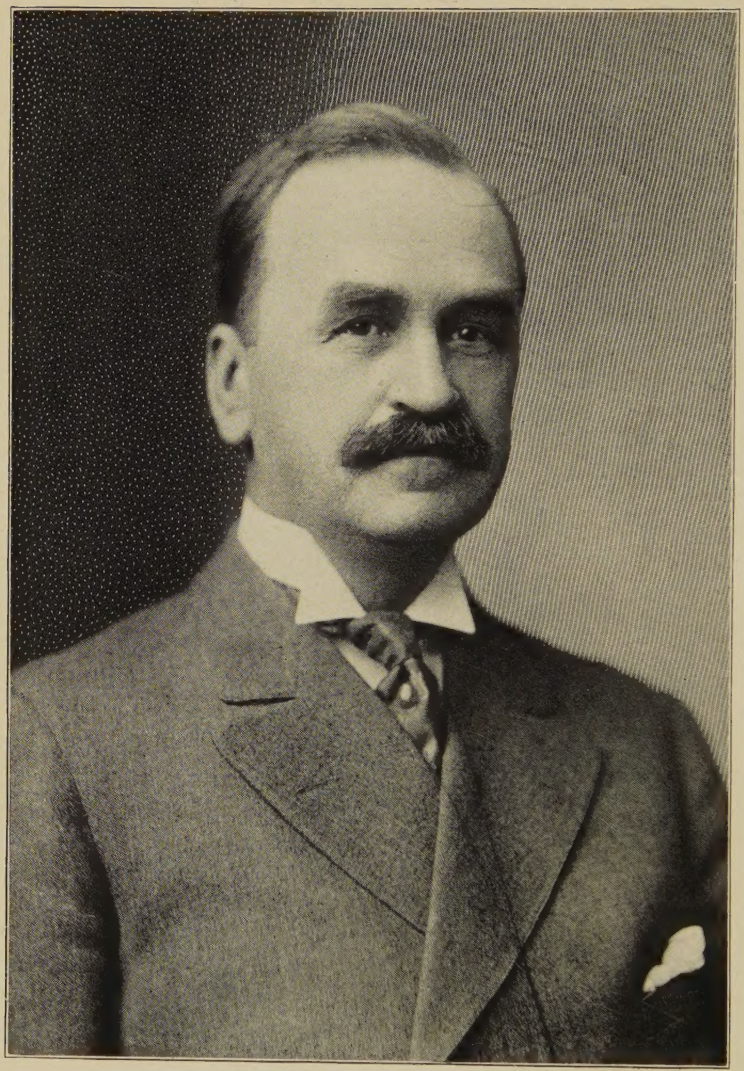

J. E. Defebaugh

History of The Lumber Industry of America

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By
JAMES ELLIOTT DEFEBAUGH
(Editor of the American Lumberman)

Volume 2

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PREFACE.

The first volume of this work was devoted to certain general subjects and to eastern Canada; this volume takes up the history of the lumber industry of the United States in detail. An appropriate beginning is found in connection with white pine. It is possible that the first trees cut on American soil by white men were yellow pine; and during certain periods the southern wood, perhaps, contributed more largely to the export trade of the colonies and of the United States than did white pine; but the latter was earlier the basis for an industry of magnitude, and, until the close of the Nineteenth Century, furnished more than any other one species, or more than any group of related species, to the internal commerce of the country.

While the southern pines were and are famous in the export trade, they supplied at home, until within a generation, hardly more than a local requirement; whereas white pine was in demand almost everywhere throughout the continent and sold in large quantities, not only in the states in which it grew but even in states which were abundantly supplied with pines of their own growth, and, furthermore, it furnished the chief building and finishing material necessary in the development of the great prairie regions west of the Mississippi River. It was the white pine that of all the timber resources of the North American continent first attracted the attention of explorers, and it was the white pine that was first the subject of Royal or legislative enactment.

This volume of the "History of the Lumber Industry of America" is, therefore, devoted very largely to the history of the white pine industry. This history is appropriately considered in its geographical relationships, and, for the sake of convenience, a beginning is made with the white pine State farthest east—a Commonwealth known for generations as the Pine Tree State, although for more than a half century pine has been second to spruce in volume of product. Beginning with Maine, the other New England states appropriately come after and then the white pine belt is followed across New York and Pennsylvania.

The history of those wonderful, virgin forests which stretched from the St. Croix River of Maine to the Red River of the North has almost been finished, and there survive only the remnants of those great resources in scattered groups of trees or in decimated woodlands, which stand as reminders of once magnificent forests of an extent and of a value to man never excelled, if equaled.

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It is an appropriate time to write this history so near its close. A century hence there may be other great and valuable white pine forests covering portions of the areas now almost denuded, but they will lack the romance of the forests that have gone. They will exist as a result of man's providence; their volume will be measured by the forester's calipers and staff; their rate of growth, tree by tree, will be kept in books, and they will be as prosaic as fields of corn or cabbage. They will return so much percent on the investment, minutely calculated in advance, and all of utility beyond this will be the influence they may have upon climate and water-flow.

Before it is too late, therefore, something of the story of the northern pines should be put into print and preserved in volumes such as these—something of their romance and charm, something of the adventures and heroism connected with their exploitation, something of what they have meant to the progress of civilization. It is a tribute to Nature's generous wealth; hereafter will come the story of man's growing of trees as he grows a beet or a rose.

Within the geographical range of white pine were and are other woods of only secondary importance. In recounting the history of the white pine of New England, the spruce and other coniferous species and the broad-leaf trees necessarily find a place; in Pennsylvania and New York the hemlock and numerous other forest species, including the oaks, the cherry, the maples and many others, have contributed to the lumber production of the states in perhaps even greater measure than the pines. Basing the arrangement of this volume, however, upon the native distribution of *Pinus strobus*, it takes in many allied interests and the pine itself has only its due share of space and attention.

In the preparation of this volume the author gratefully acknowledges the assistance of individuals too numerous to be specifically mentioned. Lumbermen, particularly of the generation that is now passing, have contributed, perhaps, most largely to the historical data. The offices of lumber exchanges and of the forestry departments of the different states have been generous in their help. Newspaper men in many cities have aided in the necessary researches, and to the National Forest Service the author is indebted for eastern woods scenes which illustrate the volume. To all of these hearty thanks is extended for generous assistance in preparing a volume so replete with information and yet which, after all, lacks so much of being a complete record of a history which has been 300 years in the making.

J. E. DEFEBAUGH.

TABLE OF CONTENTS.

CHAPTER I.

New England—Development. Pages 1–17.

Early Explorations (1)—The Virginia Patents (1)—Early Patents and Colonies (2)—The Council for New England (2)—Mason and Gorges (3)—New England Grants and Patents (4)—First New England Sawmills (6)—Timber and Mill Regulations (9)—First Surveyor General of the Forests (11)—Prices in 1700 (13)—Report on New England Forests (13)—Exportations in 1770 (15)—Early Exports from New England (17).

CHAPTER II.

Maine—Early Lumber Days. Pages 18–36.

Resources in Forests and Water Power (19)—Trees of Maine (21)—Colonial Development of Lumber Manufacture (21)—Product During First Half of Nineteenth Century (22)—Sawmills in Maine in 1859 (24)—Forest Conditions in 1892 (25)—Early Timber Land Transactions (26)—The Bingham Purchase (27)—Land Grants by State (28)—Present Timber Conditions (31)—Shipbuilding Industry (34).

CHAPTER III.

Maine—Logging Methods. Pages 37–47.

Volume of the Logging Business (37)—A Woodsman's Life (38)—Hauling to Landing (39)—The Drive (44).

CHAPTER IV.

Maine—The Penobscot District. Pages 48–62.

Early Sawmills (50)—Later Development of Penobscot Valley Industry (52)—Introduction of Improved Sawmill Machinery (53)—Penobscot Boom Company (54)—Spruce Supplants Pine

(55)—Deal Trade (56)—Lumber Trade of Bangor (57)—Logging on Penobscot Tributaries (59)—Mills in Bangor District (61).

CHAPTER V.

Maine—The Western Districts. Pages 63–76.

Early Records of York County (63)—Great Forest Fires of 1762 (66)—Early Operations on the Saco (67)—The Androscoggin (68)—The City of Portland (71)—Kennebec River District (71)—Ancient Attempts to Raft Timber Across the Atlantic (72)—Michaux's Observations on the Kennebec (73)—Log Cut on the Kennebec (75).

CHAPTER VI.

Maine—The Eastern Districts. Pages 77–92.

First Settlers Between the Penobscot and St. Croix Rivers (77)—Influx of Settlers in 1762–3 (78)—Early Machias Mills (79)—Manufacturing on the Machias River (82)—Forest Wealth of Eastern Maine (83)—Mills of Washington and Hancock Counties (83)—Union River (84)—Far-Famed Calais (86)—Calais Lumbermen and Lumber Product (88)—The Aroostook Country (89).

CHAPTER VII.

Maine—Spruce and Hardwoods. Pages 93–105.

Estimates of Spruce Stumpage (93)—Forest Fires (95)—Spruce Market (96)—Wood Pulp Industry (97)—White Birch (99)—Spool Wood Industry (100)—European Box Shooks (102)—Miscellaneous Products (104).

CHAPTER VIII.

Maine—Lumber Inspection. Pages 106–110.

Inspection Rules by Legislative Enactment (106)—Maine Inspection Law (107)—Survey of Spruce (110).

CHAPTER IX.

MAINE—STATISTICS. PAGES 111–125.

COMPARATIVE SUMMARY 1850–1900 (112)—PRODUCTS, CENSUS OF 1900 (113)—EXPORTS FROM BANGOR (115)—EXPORTS FROM PORTLAND (117)—EXPORTS FROM BATH (119)—EXPORTS FROM MACHIAS (120)—IMPORTS, FOREST PRODUCTS (122).

CHAPTER X.

NEW HAMPSHIRE. PAGES 126–147.

EARLY SAWMILLS (126)—PROGRESS OF DEVELOPMENT (127)—EARLY TIMBER CONDITIONS (129)—DISTRIBUTION OF TREES IN 1870 (133)—TIMBER AND LUMBER TRADE OF COLONIAL TIMES (137)—SHIPBUILDING (138)—EXPORTS AND IMPORTS (139)—PRESENT LUMBER RESOURCES (140)—LUMBER STATISTICS (145).

CHAPTER XI.

VERMONT—DEVELOPMENT. PAGES 148–164.

THE GREEN MOUNTAIN STATE (148)—FOREST TREES OF VERMONT (149)—FOREST CONDITIONS IN 1880 (150)—EARLY SETTLEMENTS AND SAWMILLS (152)—BENNINGTON COUNTY (155)—WINDHAM COUNTY (155)—WINDSOR COUNTY (157)—RUTLAND COUNTY (158)—ADDISON COUNTY (159)—ORANGE COUNTY (159)—CHITTENDEN COUNTY (160)—WASHINGTON COUNTY (162)—CALEDONIA COUNTY (163)—FRANKLIN COUNTY (163)—LAMOILLE COUNTY (164)—ORLEANS COUNTY (164).

CHAPTER XII.

VERMONT—TRADE AND STATISTICS. PAGES 165–177.

LAKE CHAMPLAIN (166)—STATISTICS OF LUMBER PRODUCTION (166)—EARLY TRADE ROUTES (169)—THE CITY OF BURLINGTON (170)—LAWRENCE BARNES (171)—BURLINGTON LUMBER INSTITUTIONS (172)—BURLINGTON INSPECTION (173)—IMPORTS AND EXPORTS (174).

CHAPTER XIII.

MASSACHUSETTS AND ITS FORESTS. PAGES 178–183.

SETTLEMENT (179)—RAPID DEVELOPMENT IN SEVENTEENTH CENTURY (180)—FORESTS OF MASSACHUSETTS (182).

CHAPTER XIV.

Massachusetts—Early Sawmills. Pages 184–203.

Essex County (184)—Middlesex County (188)—Suffolk and Norfolk Counties (190)—Plymouth County (190)—Worcester County (191)—Franklin County (194)—Hampshire County (198)—Hampden County (200)—Berkshire County (202).

CHAPTER XV.

Massachusetts—Forest Legislation. Pages 204–221.

Colonial Regulations (204)—Forest Legislation Under Statehood (205)—First Official Inspection (206)—Protection of White Pine Timber (208)—Sundry Acts Concerning Rights and Liabilities (209)—Second Survey Act (217)—Protection of Forests Against Fires (220)—Forest Culture Laws (221).

CHAPTER XVI.

Massachusetts—Boston. Pages 222–252.

Review of Boston Lumber Trade (222)—Personnel (225)—Lumber Prices (227)—Official Survey (231)—Report of Surveyor General's Office (234)—The Surveyor Generals (240)—Present Surveys (241).

CHAPTER XVII.

Massachusetts—Statistical. Pages 253–265.

United States Census Reports (253)—Forest Products, Census of 1900 (255)—Exports and Imports (257)—Shipbuilding and Commerce (263).

CHAPTER XVIII.

Connecticut. Pages 266–289.

Settlements and Colonies (266)—Timber Species (267)—John Winthrop's Timber Purchase (270)—Early Sawmills (271)—Cost of a Seventeenth Century Sawmill (272)—Sawmills of 1819 (277)—Forest Legislation (277)—Restrictions of Exportation (279)—Regulating Cutting of White Pine (281)—Statistics of Lumber Production (284)—Exports and Imports of Forest Products (287).

CHAPTER XIX.

RHODE ISLAND. PAGES 290–301.

EXPLORATION AND SETTLEMENT (290)—FORESTS OF 1767 (293)—SHIPBUILDING (294)—EARLY SAWMILLS (295)—STATISTICS OF THE INDUSTRY (298).

CHAPTER XX.

NEW YORK—EARLY HISTORY. PAGES 302–321.

DUTCH SETTLEMENTS (302)—ENGLISH ACCESSION (304)—BOUNDARIES AND AREAS (304)—EARLY SAWMILLS ON THE HUDSON (305)—LIST OF SAWMILLS ERECTED PRIOR TO 1810 (307)—EARLY LUMBERING METHODS (313)—TIMBER AND LOGGING (314)—LUMBER RAFTING (315)—HUDSON RIVER PRODUCT (316)—REMINISCENCES OF EARLY DAYS (317)—NARRATIVE OF WILLIAM B. MILLARD (319)—STREAMS AS PUBLIC HIGHWAYS (320).

CHAPTER XXI.

NEW YORK CITY. PAGES 322–359.

NEW YORK CITY AS A SAWMILL TOWN (322)—TRADE OF THE EARLY NINETEENTH CENTURY (325)—FIRST RETAIL LUMBERMEN'S ASSOCIATION (327)—NATIONAL WHOLESALE LUMBER DEALERS' ASSOCIATION (332)—GRADES AND BUYING METHODS (345)—MODERN TRANSPORTATION AND THE MARKETS (346)—EASTERN SPRUCE TRADE (348)—NORTH CAROLINA PINE AND CYPRESS (349)—RECEIPTS OF METROPOLITAN DISTRICT (350)—INSPECTION OF HARDWOOD LUMBER (351).

CHAPTER XXII.

NEW YORK—HARDWOOD INSPECTION. PAGES 360–386.

DEVELOPMENT OF INSPECTION METHODS (360)—CONDITIONS PRIOR TO 1890 (361)—LIGHTERAGE AND STORAGE CHARGES (362)—NEW YORK INSPECTION IN THE '80'S COMPARED WITH LATER METHODS (365).

CHAPTER XXIII.

NEW YORK—THE EASTERN FORESTS. PAGES 387–407.

THE ADIRONDACK FOREST (387)—EARLY LAND GRANTS AND PURCHASES (388)—THE BOYLSTON TRACT (389)—BROWN'S TRACT (390)—LIST OF PATENTS AND LAND GRANTS IN NORTHERN NEW YORK (391)—

Forest Preservation and Logging Laws (393)—Forest Preserves (396)—Forest Preserve Act of 1895 (397)—Forest Preserve Area (399)—Act of 1897 (400)—Forest Fires of 1903 (403)—Lumber Product of Forest Preserves (404)—Forest Products of New York in 1905 (406).

CHAPTER XXIV.

New York—Albany. Pages 408–423.

The Erie Canal (409)—The Lumber District (409)—Personnel of Albany Trade (411)—Changes in Trade (413)—Prices of White Pine (417)—Receipts of Lumber (418)—Albany Inspection (420).

CHAPTER XXV.

Central and Western New York. Pages 424–444.

Effect of Erie Canal (424)—Susquehanna River District (426)—Early Shipments via the Susquehanna (427)—Broome County (429)—Lumber for the National Capitol (430)—Tioga County (432)—Chemung County (432)—Oswego County (435)—Erie County (436)—Orleans County (437)—Southwestern New York (437)—Chautauqua County (440)—Description of Early Mills and Methods (441).

CHAPTER XXVI.

New York—Buffalo and the Tonawandas. Pages 445–465.

Trade Position of Buffalo (445)—Canal Trade (446)—Methods of Receiving Lumber (447)—Personnel of the Trade (449)—Old Contract of Sale (450)—Lumber Prices (452)—Changes in Grades (453)—Influence of Tariffs (454)—Rise of the Tonawandas (455)—Sawmills at Tonawanda (457)—Development in Receipts from the West (458)—Tonawanda Receipts and Shipments (461)—Personnel of Tonawanda Trade (463)—Lumber Associations (464).

CHAPTER XXVII.

New York—Statistics. Pages 466–484.

Mills in Colonial Times (466)—Census Reports (468)—Foreign Trade (471)—Imports, New York City (481)—Exports, New York City (483).

CHAPTER XXVIII.

New Jersey—Political and Forestal History. Pages 485–495.

Charters of Settlement (485)—Primitive Forest (486)—The Pine Barrens (489)—Mining Buried Cedar (493).

CHAPTER XXIX.

New Jersey—Lumbering and Statistics. Pages 496–516.

Early Sawmills (496)—Cost of Lumbering in Eighteenth Century (499)—Records of Early Sales (500)—Early Timber Legislation (506)—Forest Fires (509)—New Jersey Lumbermen's Protective Association (511)—Lumber Statistics (513)—Foreign Trade (516).

CHAPTER XXX.

Pennsylvania—Early History. Pages 517–529.

Early Settlements (517)—Connecticut Settlements (519)—Penn's Charter (519)—Acquisition of Delaware (521)—Mason and Dixon's Line (522)—Separation of Delaware (523)—Philadelphia's Rise and Growth (524)—Settlement of Western Pennsylvania (525)—Extinguishment of Indian Claims (526)—Map of Indian Purchases (528).

CHAPTER XXXI.

Pennsylvania—Forest Conditions. Pages 530–555.

Native Tree Species (530)—Timber Resources (535)—Range of White Pine (539)—Location of Species (540)—Forestry (542)—Area of Forest Reserves (544)—Forest Legislation (547)—Forest Fire Legislation (550)—Fire Warden Law (554).

CHAPTER XXXII.

Pennsylvania—Early Lumbering. Pages 556–561.

Earliest Sawmills (556)—Early Prices and Trade (558)—First Sawmills in Counties (558)—Disappearance of White Pine (560).

CHAPTER XXXIII.

PENNSYLVANIA—THE EAST. PAGES 562–574.

EARLY SAWMILLS (562)—PIKE AND WAYNE COUNTIES (563)—SUSQUEHANNA COUNTY (564)—BRADFORD COUNTY (566)—WYOMING, LUZERN, COLUMBIA AND SCHUYLKILL COUNTIES (569)—FRANKLIN AND LACKAWANNA COUNTIES (570)—RAFTING ON THE SUSQUEHANNA (572)—MILLS OF TODAY (573).

CHAPTER XXXIV.

PENNSYLVANIA—THE PHILADELPHIA MARKET. PAGES 575–590.

EARLY SHIPBUILDING (576)—YARDS AND MILLS (577)—FORMER LUMBER PRICES (578)—PRICE LIST OF 1875 (581)—REMINISCENCES OF THE TRADE (582)—PRESENT PERSONNEL (584)—GRADING LUMBER (586)—SOURCES OF SUPPLY (587)—LUMBER RECEIPTS (589).

CHAPTER XXXV.

PENNSYLVANIA—THE WEST BRANCH. PAGES 591–607.

CHARACTER OF WEST BRANCH OF SUSQUEHANNA (591)—BIRTH OF THE INDUSTRY (592)—FIRST SAWMILL IN WILLIAMSPORT (593)—EARLY MILLS AND SETTLEMENTS (595)—SUSQUEHANNA BOOM COMPANY (596)—FLOODS (598)—OUTPUT OF SUSQUEHANNA BOOM (599)—MAJOR PERKINS AND JOHN DUBOIS (600)—THE PRESENT INDUSTRY (602)—DECLINE OF RAFTING (602)—LUMBERMEN'S EXCHANGE (603)—OPERATIONS ON HEADWATERS (604)—WILLIAMSPORT INSPECTION (606).

CHAPTER XXXVI.

NORTHWESTERN PENNSYLVANIA. PAGES 608–627.

LAND GRANTS AND SETTLEMENTS (608)—LAND PRIVILEGES (611)—SUPPLY OF STANDING HEMLOCK (612)—SAWMILL EQUIPMENT (614)—RIDGWAY (615)—THE GOODYEAR OPERATIONS (616)—HEMLOCK OPERATIONS IN THE '90's (618)—FOREST COUNTY (619)—WARREN COUNTY (621)—ALLEGHENY RIVER SHIPMENTS (623)—CLARION COUNTY (624)—CLEARFIELD COUNTY (625)—JOHN DU BOIS (625)—NORTHWESTERN COUNTIES (626).

CHAPTER XXXVII.

SOUTHWESTERN PENNSYLVANIA. PAGES 628–634.

TITLES AND BOUNDARIES (628)—TRANSPORTATION DEVELOPMENT (629)—FAYETTE, SOMERSET AND HUNTINGDON COUNTIES (630)—CAMBRIA, INDIANA AND WESTMORELAND COUNTIES (631)—BEAVER AND ALLEGHENY COUNTIES (632)—WASHINGTON AND GREENE COUNTIES (633)—ROMANCE OF AN OLD MILL (633).

CHAPTER XXXVIII.

PENNSYLVANIA—THE PITTSBURG DISTRICT. PAGES 635–644.

PITTSBURG IN COLONIAL TIMES (635)—FIRST SAWMILLS (636)—THE BOATBUILDING INDUSTRY (638)—GROWTH OF THE LUMBER BUSINESS (639)—SOURCES OF LUMBER SUPPLY (640)—LOCAL LUMBER CONSUMPTION (641)—PITTSBURG LUMBER INSTITUTIONS (643)—ALLEGHENY CITY LUMBERMEN (644).

CHAPTER XXXIX.

PENNSYLVANIA—STATISTICS. PAGES 645–655.

CENSUS REPORTS (646)—FOREST PRODUCTS (646)—TIMBER USED IN COAL MINES (649)—LEADING PENNSYLVANIA MILLS (651)—EXPORTS AND IMPORTS (653).

LIST OF ILLUSTRATIONS.

James Elliott Defebaugh, the Author ..... FRONTISPIECE
A Veteran Adirondack White Pine ..... Facing Page 1
John Morrison, a Veteran Logging Operator of Maine ... " 40
Arquille Boom, Near Bangor, Maine ..... " 54
Typical Spruce Stand in Maine ..... " 94
New Hampshire Spruce, Old Stand ..... " 130
"Cathedral Aisle," White Mountain Forest, New Hampshire ..... " 144
Water Front, Burlington, Vermont ..... " 160
Lawrence Barnes, "Father" of the Burlington Lumber Trade ..... " 172
Solomon Adams Woods, Inventor of Woodworking Machinery ..... " 252
Second Growth Adirondack White Pine ..... " 314
Typical Adirondack Mountain Forest ..... " 388
Augustus Sherman, Notable Lumber Pioneer of New York " 404
The Albany Lumber District (Map) ..... " 410
Indian Purchases in Pennsylvania (Map) ..... Page 528
Pennsylvania Hemlock, Elk County ..... Facing page 542
John DuBois, Famous in Pennsylvania Lumbering ..... " 600
Frank Henry Goodyear, Leader in Hemlock Industry of Pennsylvania ..... " 618

A VETERAN ADIRONDACK WHITE PINE

RAQUETTE LAKE, HAMILTON COUNTY, NEW YORK

CHAPTER I.

NEW ENGLAND—DEVELOPMENT.

Although the shores of New England were touched by the early voyagers only a few years after the discovery of America by Columbus, a hundred years went by before that section was outlined in any minute way. It is supposed to have been first coasted by Sebastian Cabot in 1498, and by Verrazani in 1523 and 1524, but it was not until the beginning of the Seventeenth Century that much attention was paid to it.

In 1602 an English sailor, by the name of Bartholomew Gosnold, commanded an expedition for exploration in "the north part of Virginia" with a view to the establishment of a colony. On this voyage he first saw land in Massachusetts Bay, probably near what is now Salem harbor; then sailing southward he discovered and named Cape Cod. His discoveries terminated at Marthas Vineyard and the Elizabeth Islands. This exploration was absolutely new and aroused much interest in that region. The next year, 1603, Martin Pring coasted from Maine to Marthas Vineyard, collecting sassafras, and in 1605 George Weymouth commanded a vessel which reconnoitered the same coast, with an eye to settlement, and ascended either the Kennebec or the Penobscot River fifty or sixty miles. He particularly noted and secured specimens of the white pine, and from that fact its popular name in Europe is Weymouth pine.

At the time of these explorations, however, New England had been granted by the Crown for purposes of exploration, settlement and exploitation. The first grant seems to have been made by Queen Elizabeth, in 1578, to Sir Humphrey Gilbert, an elder half-brother of Sir Walter Raleigh. This charter empowered him for the next six years to discover "such remote heathen and barbarous lands not actually possessed by any Christian prince or people" as he might be fortunate enough to find, and to occupy the same as their proprietor. His colonizing expedition accomplished nothing, except to go through the form of taking possession of the island of Newfoundland.

In 1584 Sir Walter Raleigh obtained a patent precisely like Gilbert's and sent two ships to explore the country. The record of their voyage, under Arthur Barlow and Phillip Amidas, says that on July 2 "the presence of shallow water and the smell of sweet flowers warned them that land was near. . . . Coasting along for about one hundred and twenty miles the voyagers reached an inlet, and, with some difficulty, entered it. They

then solemnly took possession of the land in the Queen's name and then delivered it over to Raleigh according to his patent." They found that the land which they had touched was an island. It was Roanoke Island, within the present limits of North Carolina. The story of the later settlement of Virginia is an interesting one, but we have to do here with the question of titles.

EARLY PATENTS AND COLONIES.

John Fiske thus describes the next step in this direction: "In 1606 a great joint-stock company was formed for the establishment of two colonies in America. The branch which was to take charge of the proposed southern colony had its headquarters in London; the management of the northern branch was in Plymouth, in Devonshire. Hence the two branches are commonly spoken of as the London and Plymouth companies. The former was also called the Virginia Company, and the latter the North Virginia Company, as the name of Virginia was then loosely applied to the entire Atlantic Coast north of Florida. The London Company had jurisdiction from 34 to 38 degrees north latitude; the Plymouth Company from 45 degrees down to 41 degrees; the intervening territory, between 38 degrees and 41 degrees, was to go to whichever company should first plant a self-supporting colony."

Under the Plymouth Company there was considerable exploration of the New England Coast and something of a fishing industry was established. The London Company falling into royal disfavor, the Plymouth Company sought new letters-patent, with an enlargement of its domain, and on November 3, 1620, King James incorporated forty of his subjects, some of them members of his household and his government, the most wealthy and powerful of the English nobility, as the "Council established at Plymouth, in the county of Devon, for the planting, ruling, ordering and governing New England in America." This body was commonly known as "The Council for New England."

The territory, which was conferred on them with absolute property rights and unlimited powers of government, extended from the 40th to the 48th degree of north latitude—or from midway between Sandy Hook and Coney Island to north of the northernmost point of Maine—from the Atlantic to the Pacific. The Council for New England had the power to grant sub-charters, and it was under its authority that subsequent grants were made.

The first colony established in due form in New England was that at Plymouth. In 1619 and 1620 patents were secured from the London Company and in the latter year the "Pilgrim Fathers" set out for the New World with the intention of landing in the northern part of that company's domain, but, as a matter of fact, landed at Plymouth, on

Cape Cod Bay. This location was unauthorized, and so in 1621 a new patent from the Council for New England was received, signed by the Duke of Hamilton, the Duke of Lennox, the Earl of Warwick, Lord Sheffield and Sir Ferdinando Gorges. This patent recognized the colony and made small grants of land to individuals and to the colony as a whole, but in 1629 a new patent granted to William Bradford and his associates the territory between the "Coahasset" and Narragansett rivers and between the Atlantic and a point in the interior. This approximately fixed the present boundary between Massachusetts and Rhode Island.

The Massachusetts Bay Colony originated in two successive Dorchester companies, which were succeeded by the Massachusetts Bay Colony, under a charter granted on March 4, 1629, to "The Governor and the Company of Massachusetts Bay." It granted territory from three miles north of the Merrimac River to three miles south of the Charles River, from the Atlantic to the "Western Ocean," and in 1630 the Puritans landed and occupied Charlestown and Shawmut, or what is now Boston proper. These two colonies were united in 1692 and thus defined, with approximate accuracy, the present north and south boundaries of Massachusetts, the western boundary being fixed by the adjustment made with New York, leaving Massachusetts, however, its territory in what is now the central West.

The establishment of Maine and New Hampshire introduced two individuals prominently concerned in the early land grants of New England, whose careers had so vital a bearing upon subsequent history that special mention should be made of them here. They were Captain John Mason and Sir Ferdinando Gorges.

Mason was a native of Norfolk County, England, where he was born in 1556. As a young man he served in the navy. In 1615 he was made Governor of Newfoundland, whither he went and of which, in 1620, he published a description. In 1617 he explored the coast of New England. In 1624 Mason was obliged to withdraw personal attention from his affairs in America on account of the war between England and Spain, in which his services were required as a naval officer of experience. He was advanced to the office of treasurer and paymaster of the English army in the war.

Sir Ferdinando Gorges, born in 1565 in Somersetshire, was a man of much prominence in English public affairs. For thirty years he was captain of the Castle and Island of St. Nicholas, at Plymouth, and was a prominent member and the treasurer of the Plymouth Company. He, too, in 1624, was obliged to postpone his American projects on account of the war.

These two men were instrumental in securing the first land patent

granted by the Plymouth Company, which was issued to Sir William Alexander, covering a tract which he called New Scotland.

In 1621 or 1622 the land lying between the Naumkeag and the Merrimac rivers, lying entirely within the present boundaries of Massachusetts, was granted by the Council for New England to Captain John Mason, who called it Marianna.

August 10, 1622, the land lying upon the sea coast between the Merrimac and the Kennebec rivers, and extending sixty miles into the country, was granted to Sir Ferdinando Gorges and Captain John Mason jointly. These two men, of high position and much influence, thus became proprietors of a large area in New England within two years after the date of the first permanent settlement. Seven years later, when Mason and Gorges were relieved of their military duties, they agreed to a division of their Province of Maine, so called, and on November 7, 1629, the Council for New England granted Mason a patent of all that part of the Province of Maine lying between the Merrimac and the Piscataqua rivers and he called it New Hampshire. Almost immediately thereafter Gorges and Mason procured a grant from the Council for a large tract reaching to Lake Champlain, from which region the French had just been driven. This grant was called Laconia. For the purpose of advancing their interests in Laconia as well as on the Piscataqua, Mason and Gorges joined with them six London merchants under the style of the Laconia Company, and received also a grant of a tract of land lying on both sides of the Piscataqua River on the sea coast within the territory already owned by Gorges and Mason severally.

Many other grants were made, beginning with 1623, some of them conflicting with previous ones. The coast from the Piscataqua to the Kennebec was covered by six patents, the most important bordering on Casco Bay and named Ligonia. But in 1639 Gorges was made Lord Proprietor of Maine, with practically sovereign powers. In 1677 Massachusetts purchased from the Gorges heirs all their interest in the Province and in 1691 a new charter was issued by William and Mary combining the provinces of Acadia, Maine and Sagadahoc, with the Massachusetts colonies proper, into one province; so that Maine was thereafter, until 1820, a part of Massachusetts. In the shifting of titles in northern New England, however, New Hampshire was considered a royal province, its governors being appointed by the Crown.

Connecticut had its origin in two independent colonies, those of Connecticut and New Haven. Although claimed by the Dutch, and to a certain extent occupied by them, about 1,635 emigrants from Massachusetts Bay settled on the Connecticut and set up an independent government. The New Haven colony was established in 1638 and it also in-

stituted an independent government. On April 20, 1662, Charles II issued a royal charter to the freemen of Connecticut, under the name of "The Governor and Company of the English Colony of Connecticut in New England in America," and granted to it all that part of New England south of the Massachusetts line and west of the Narragansett River or Narragansett Bay and extending to the "South Sea." This was the basis of the Connecticut colonial territories in the West. The four colonies of Plymouth, Massachusetts Bay, Connecticut and New Haven formed a New England confederacy which lasted from 1643 to 1684.

Rhode Island always remained an independent commonwealth, with the exception of a short period of forced consolidation with the other New England colonies, until it entered the Union in 1790. On March 14, 1644, Roger Williams, the founder of Providence, secured a charter for the incorporation of "The Providence plantations in Narragansett Bay in New England." This combined the three colonies of Providence, Aquidneck and Warwick.

To this point the main facts as to the origin of the present New England states have been given except regarding Vermont. The colonies of Connecticut and Massachusetts extended by charter west to the Pacific Ocean, but, by a grant of Charles II, New York was bounded on the east by the Connecticut River, thus conflicting with the express letter of the Massachusetts and Connecticut charters. After a long controversy the line of division between these colonies was fixed, by mutual consent, at twenty miles east of the Hudson River, running in a nearly north and south direction. But this did not settle the western boundary of New Hampshire, which had no such definite claim to western territory. On the assumption, however, that the western boundary of New Hampshire should be the western boundary of Massachusetts extended north, its Governor secured authority from the King to issue patents for unimproved lands west of the Connecticut. This led to the long dispute over the so-called "New Hampshire grants" between New Hampshire and New York, which subject will be treated more fully in connection with Vermont. While the New Hampshire grants remained undisturbed in the hands of the actual settlers, Vermont was technically a part of New York until its admission into the Union in 1791.

In this brief review of the basis of the division of territory in New England no attempt has been made to mention all the charters which had bearing on boundary lines and authority, or all of the many disputes arising in connection therewith, but perhaps sufficient has been given to serve as an outline of the events and procedures which resulted in the establishment of the New England states in their present areas and shapes.

THE FIRST NEW ENGLAND SAWMILL.

The beginnings of lumbering as an industry in the New World are to be found recorded in histories and old documents, but only in part, and with authorities often disagreeing as to exact dates and sometimes as to locations. While one of the first tasks of the early settlers in New England was to fell trees for shelter and fuel, the sawmill came only a few years later and the first seems to have been established, not in Plymouth Colony or in Massachusetts Bay Colony proper, but in extreme southwestern Maine.

A writer in the *North American Review*[1] says that the first sawmill built in New England, and very likely in America, was at Agamentico, which was the ancient name of York in Maine, in 1623, or the year following, under the direction of Sir Ferdinando Gorges, from whom is quoted the following: "I sent over my son and my nephew, Captain William Gorges, who had been my lieutenant in the Fort of Plymouth, with some other craftsmen for the building of houses and the erecting of sawmills." The conclusion of this author is not, however, supported by all historians who treat of the subject.

In Bolles' "Industrial History of the United States" it is stated that the first sawmill known to have been erected in New England was on Salmon Falls River near the present city of Portsmouth, New Hampshire, and built soon after the land was granted, in 1631, to Mason and Gorges, the great proprietaries of that region.

John E. Hobbs[2] says that the business of lumbering had its beginning in the old town of Berwick, Maine, "for in that town was erected in 1631, the first sawmill in the New World of which the date is certain; also the second sawmill in 1634, and here also in 1650 was built the first gang sawmill in this continent, if not in the world."

In the "New Hampshire Provincial Papers," Volume I, page 108, it is recorded that the first attempt at settlement at the mouth of the Piscataqua River was made about the year 1623, but that in 1631 there were only three houses "in all that side of the country adjoining unto Piscataqua River." This settlement, known until 1653 as Strawberry Bank, became the present city of Portsmouth. It seems evident that there was no sawmill on the west side of Salmon Falls River, in what is now New Hampshire, for in 1653 the inhabitants of Strawberry Bank, in a petition to the General Court at Boston, asking to be set apart as a township to be called Portsmouth, made this statement: "Whereas there is much benefitt by Sawmills in other townes in this river & adjacent townes there is none in this Towne, but only one which was never perfected nor like to bee."

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[1] *North American Review*, 1844, Vol. LIII, p. 321.
[2] *Forestry Quarterly*, 1905, Vol. IV, No. 1.

In the "New Hampshire Provincial Papers," Volume I, page 45, is found a deposition of Thomas Small, of Piscataqua, who testified in 1685 as follows: "The deponent doth very well remember that Captain Mason sent into this country eight Danes to build mills, to saw timber and tend them, and to make potashes; and that the first saw-mill and corn-mill in New England was erected at Capt. Mason's plantation at Newichwannock upwards of fifty years—where was also a large house and conveniences of outhouses, and well fortified with stores of arms. That about forty years since the said house and buildings were burned to the ground." Newichwannock was what is now known as South Berwick, Maine.

According to Belknap's "History of New Hampshire" it seems certain that there could not have been a sawmill at Newichwannock prior to May, 1631, for in the previous year Thomas Eyre, one of the company of Laconia, wrote from London to Mr. Gibbins, the factor of the company at Newichwannock, the following letter: "Mr. Gibbins:—Yours of the 8th April, 1630, from Plymouth I received—Your next to me is dated the 21st July last at Pascataquacke—Your third letter is dated the 14 of August by which I perceive diverse of the commodities and provisions which you carried with you in the barke Warwicke, were not to your liking for which I am sorry—I hope by the Pied Cowe you find it otherwise. I pray you write me how you like the hatchetts sent you by that ship and how all goeth. I like it well that your governor will have a stocke of boards at all times readie. I hope you will find something to relade both the Pied Cowe and the Warwicke. I will now put on the sending of you the moddell of a saw-mill that you may have one going. —Your loving friend, Tho. Eyre."

The last sentence would imply that previous to that time there had been no sawmill at this point, but Belknap states that in 1631 Mr. Gibbins had the care of a sawmill and lived in a palisaded house at Newichwannock where he carried on trade with the Indians.

The reference in the above letter to a stock of boards to be at all times ready probably referred to lumber manufactured by hand, perhaps by pitsawing, but more likely by riving and hewing.

Summing up these statements, it seems reasonably certain that the first sawmill in New England was built at York, Maine, soon after 1623, and the second on Salmon Falls River, in what is now South Berwick Township, Maine, in 1631 or the year following.

These mills were doubtless of the type which prevailed for the succeeding two hundred years. They were driven by water power, and the sawing machinery consisted of an upright saw in a frame driven by a connecting rod from a crank attached to one end of the water wheel shaft. The log was moved against the saw by a pawl and ratchet gear driven

by the same power as the saw in time with it, though probably it was moved by hand in some of the older mills. This form was known as a sash or gate saw. The next advance was simply the introduction of several parallel saws into the sash. This was the gang saw, which, in various improved forms, is still in use. The next improvement was the mulay saw, a single saw, also, but so much more powerful and rapid that the 2,000 or 3,000 foot output of the sash saw was increased to 5,000 to 8,000 feet a day. These were the major improvements until the adoption of steam as a motive power and the perfection of the circular saw for cutting logs.

Notwithstanding that Plymouth was the first permanent English colony in New England, it did not have a sawmill until about 1640,[3] the exact date being unknown. The first sawmill in Plymouth colony of which satisfactory record exists was probably built on Third Herring Brook, in the town of Scituate, in 1657. The authority for its establishment, showing the interesting conditions on which the grant was made, was as follows:

> At a full town meeting of the town of Scituate, Nov. 10th, 1656, free liberty was this day granted to any man or men of the town to set up a saw-mill upon the Third Herring brook, as near North River as convenient it may be, on these conditions, namely, that in case any of the townsmen do bring any timber into the mill to be sawed, the owners of the mill shall saw it, whether it be in boards or planks, before they saw any of their own timber, and they are to have the half for sawing of the other half. And in case any man of the town, that doth not bring any timber to the mill to be sawed, shall want any boards for his own particular use, the owner of the mill shall sell him boards for his own use, so many as he shall need, for the country pay, of three shillings and six pence an hundred inch sawn; but in case the men of the town do not supply the mill with timber to keep it at work, the owners of the mill shall have liberty to make use of any timber upon the common to saw for their benefit. The said sawmill to be built within three months from this date; otherwise this order to be void.

This mill was destroyed twenty years later by Indians.

Massachusetts did not develop her lumber industry as fast as did Maine, but a number of sawmills seem to have been erected within the territory of the Massachusetts Bay Colony between 1640 and 1650. It is probable that Manchester had a mill as early as 1644. In Andover a mill was probably erected in the same year, when a timber cutting privilege was granted to encourage the erection of one. It is probable that Reading had a sawmill prior to 1650, while Charlestown probably had a sawmill, as well as a gristmill, in 1645. Antedating all these, however, was a water mill erected in Dorchester in 1633, although it is not absolutely certain that it was a sawmill.

Connecticut was not far behind Massachusetts in the adoption of power for converting logs into boards and planks, for it is reported that the

[3] Deane's "History of Scituate," 1831.

younger Winthrop, afterwards Governor of Connecticut, brought a millwright to New London and put up a sawmill in 1651. Others were built near Hartford in 1671 and 1680, and before the close of that century there was a considerable number in what is now Connecticut.

Although somewhat outside the province of this chapter, it should be noted, because of its influence on New England development, that the Dutch erected sawmills, probably operated by wind rather than water, on Manhattan Island at a very early date. Some records indicate the erection of three mills in 1623, though the date usually assigned for them is 1633. While these first New York mills do not seem to have been profitable they were soon followed by others on both sides of the Hudson, and the development of the sawmill business followed that river and its tributaries, being reflected later in the industry in western Vermont where, however, there seem to have been comparatively few sawmills before the Revolution.

After about 1650 the sawmill almost immediately followed settlement in any portion of New England, though by that time many were in operation. It is interesting to know that the sawmill was established in the American colonies long before it was in England. The driving of a saw by power was an invention dating back into the remote past and there are antiquarians who claim to have discovered evidences of the use of the sawmill in Egypt at about the time of the Exodus. It is alleged that Germany had sawmills in the Fourth Century, but it is certain that, from the middle of the Fifteenth Century on, the sawmill was a common institution in Europe.

The first one erected in England was supposed to have been built in 1663, at which time hundreds of them were in use in New England, but this mill was torn down to gratify a popular prejudice which insisted that such an institution would take the bread out of the mouths of the working people. As late as 1767 a sawmill was destroyed by an English mob.

TIMBER AND MILL REGULATIONS.

But in the colonies the people welcomed anything that would save labor, and so early settlement was very largely directed in its course by the existence of water power. Perhaps of more importance than the sawmill was the grist mill, at which the colonists could have their corn and wheat ground, but the combination of grist and sawmill was the usual thing. At Taunton, Massachusetts, when it was proposed to erect a sawmill, permission was given on the condition that it "be not found hurtful to the grist-mill," presumably from the fear that the power used by the one might hinder the operation of the other.

The right to erect and operate sawmills seems to have been, in the

early days, granted by town meetings and there was shown a lively appreciation of their importance in the economic organization of the communities and also of the desirability of limiting their activities in cutting timber. For example: In a grant by the "townsmen of Saco" to Roger Spencer it was stipulated that he should build his mill within a year, that all the "townsmen should have bordes 12 pence in a hundred cheaper than any stranger," and that the townsmen who would work erecting the mill "as cheap as a stranger" should have the preference.

In 1660 Portsmouth imposed a penalty of five shillings for every tree cut by the inhabitants except for their own buildings, fencing and firewood. In Kittery the number of trees that could be felled before being manufactured was strictly limited. In Dover the following were enactments for the same purpose: "It is this day[4] ordered that noe inhabitant shall fall above tenne trees for clapboards or pipe staves until he hath wrought y and he that shall have above tenne trees fallen at any time not wrought up shall forfeit for everie tree tenne shillings.

"It is this day ordered that noe man shall fall any timber for clapboards or pipe staves, planks or boards without approbation of the townsmen."

Again, in 1665 the selectmen appointed certain individuals to make search of the surrounding woods and seize any timber illegally felled or staves made from timber in violation of previous ordinances.

Regulations for the use of timber occupied a prominent place in the annals of colonial times. In 1640 the inhabitants of the town of Exeter, now in New Hampshire, ordered that "none shall fell any oke timber within half a mile of this part of the town except it be upon their planting lott, or for buildings or fences, upon the penalty of each tree 5 shillings." The General Court, upon a petition from the inhabitants of Exeter, ordered that all pine trees fit for masts, twenty-four inches in diameter and upward, within three feet of the ground, that grew more than three miles from the meeting house within the boundary of the town, be reserved for the public; and if any person or persons should presume to fell any such pine trees fit for masts they should pay forfeit £10 for every tree; half to go to the informer and the other half to the public treasury of the county.

It is reported that at Cape Porpoise (southwestern Maine) a town meeting granted the right to set up a saw provided the applicant furnished his townsmen with lumber for their own use at "12 pence the hundred under prices current." Another person, at the same place, was required to pay forty shillings rent as a tax to support Fort Royal at Falmouth, now Portland, and a third was required to pay a yearly rental of

[4] "Provincial Papers of New Hampshire," Vol. III, p. 334.

fifty shillings and to allow the inhabitants to "saw their own boards at the halves."

These orders show, first, the care with which the inhabitants, of at least some of the settlements, safeguarded the surrounding forests, and, second, that these forests were considered common property. Laws of such character were continued until Revolutionary times, and, according to Williamson, as late as 1784 Massachusetts passed a law to protect the white pine yet standing upon the public lands in the eastern forests (of Maine), which it characterized as "by far the noblest trees." The penalty for cutting them was $100 a tree, recoverable by indictment.

Under independence there soon came a change in the attitude of the Government toward the forests. In 1786 Massachusetts abandoned this policy of protection in favor of immediate realization on the resources of the Commonwealth and of settlement. Whereas under royal authority, exercised either direct or through colonial representatives of the Crown, the restrictions as to the cutting of timber were severe and even local authorities, as in Dover, Exeter and Kittery, looked carefully after the interests of the forests, within twelve years after the close of the Revolutionary War, Massachusetts had disposed of 3,500,000 acres, much of it in an almost forced way by means of a lottery, which is more particularly mentioned in the chapters devoted to Maine.

Early in the Eighteenth Century the British Crown became interested in the preservation of timber suitable for masts and shipbuilding, and severe ordinances were enacted prohibiting the cutting of trees suitable for masts on any of the possessions of the Crown. Without means of enforcing such orders, however, in so wild a country it soon became necessary to adopt special measures to enforce the laws controlling the cutting of timber and so came about the appointment of the first Surveyor General of forests. This was accomplished in 1706 by the appointment of John Bridger. From the "Provincial Papers of New Hampshire," there has been taken the following abridgment of this commission:

ANNE *R.*

ANNE, by the Grace of God, Queen, . . . Judging it to be of great advantage to our service, That all our Dominions be furnished with Masts, Pitch, Tar, Hemp and all other Naval stores from our said Colonies and Plantations: KNOW YE, That wee, reposing especial trust and confidence in the skill, diligence and integrity of the said John Bridger in and for the execution and performances of the several services above mentioned, and for other good causes and considerations us hereunto moving, of our special grace, certain knowledge and meer motion, Have nominated, constituted and appointed, and do hereby nominate, constitute and appoint him, the said John Bridger, to be surveyor-general of all and singular our Woods within all and every our Plantations in the Continent of America, now growing or being, or which hereafter shall or may Grow and be within our said Colonies & Plantations, or any of them; and wee doe hereby direct, authorize and require the said John Bridger to instruct our loveing

subjects within our said Colonies in making tar and pitch, raising and curing hemp, and in all the matters relating to the production and the manufacturing of Naval stores there: To hold, execute and performe the said office of Surveyor General, during our pleasure, . . . and we have thought fit to grant an allowance unto him, the said John Bridger, a Salary, or yearly Sum of two hundred pounds of lawful money of England. . . . And we do hereby authorize and require the said John Bridger, his Deputy or Deputies—at all convenient times and seasons in the year, to view and Survey all our said Woods and Timber; and alsoe to mark such of the said Trees that now or hereafter shall be fitt and proper to be taken for the use of our Navy; and to keep a Register of the same; transmitting half yearly or oftener an Account of his proceedings herein to our High Admiral, or Commissioners in executing the office of High Admiral for the time being, to our High Treasurer or Commissioners of our Treasury. . . . And, lastly, all our Governors, Lt. Governors, Justices, Constables, and all other our civil officers within our said Colonies, . . Are to be aiding, . . . the said John Bridger or his Deputys, . . . in the due execution of his and their duty. . . .

Given at our Court at Saint James, the twenty fourth day of December, 1705; In the fourth year of our Reigne.

By her Majestie's Command.

GODOLPHIN.

18th October, 1706.

The above gave broad powers to the Surveyor General and also imposed upon him important duties. He, through his deputies, was required to mark all trees to be reserved for the Crown and he was also required to instruct the Queen's subjects in the art of making tar and pitch, raising and curing hemp and generally in regard to the production and manufacture of naval stores. This commission appears to have been the cause of many abuses and conflicts between the authorities and the people in regard to timber. The same John Bridger to whom was issued the above commission, in 1700 made a report which is worthy of reproduction from the "Provincial Papers of New Hampshire," where it is to be found:

Honorable Sirs:—

In May, June and July last, I prepared a great many thousand trees in order to make tar for the use of his Majesty, in the river of Piscataqua, particularly on the commons of Dover, on that side next to the Suhawannick River, and in the woods next Quamphegen mill, and in the woods by John Wingett's, and on a point below the house of William Henderson, sen; all which lands were the Commons of the adjacent town and not fenced where the said trees were prepared.

Notwithstanding his Majesty has been at the expense of preparing said trees for his use,—as by an Act of the Assembly every one may improve any of the common land or its produce, more particularly I presume his Majesty might, when no injury to the subject,—yet some envious, malitious and unthinking people have felled many of the said trees which I prepared, to the great disappointment of the project I am on, and his Majesty's interest at home as well as here.

Such little and litigious actions makes me not doubt but the trees that were burnt was by design. I am sure this is an introduction to such belief.

I therefore make these unlawful actions known to you, which neither increase the actors interest, nor does it blason your loyalty, except by punishing the offenders,

which done, will prevent my asking redress from other places or persons; otherwise must seek to put a stop to such proceedings by the best and momentous care I am capable of. I shall wait your answer before I say to any else.

Your Honor's

Humble Sert

JOHN BRIDGER.

BOSTON, Jan. 21, 1700—1.

Superscribed—"On His Maj' Service, to Hon. Wm. Partridge, Esq., Lt. Govr., And Council of his Maj' Province, of New Hampshire at Piscataquis."

This was not an isolated case, for the colonists generally seem to have shown little regard for the broad arrow or for the unmarked trees which were suitable for masts and shipbuilding, but which, because of their quality, appealed to the settler and the sawmill owner.

PRICES AND TRADE CUSTOMS IN 1700.

In the same year a significant report was made to the "Lords of Trade" by Richard Coote, first Earl of Bellomont, who was appointed colonial Governor of New England in 1695. In it he went into much detail as to the character and value of the product of the white pine forests of New England, with special reference to the material furnished at Portsmouth. He pointed out the advantages that would accrue to England by a right use of these timber resources and gave much detailed information of interest from an historic standpoint. Extracts from this record are as follows:

The advantages that will redound to England by a right use of these plantations, are infinite and inestimable, not only tar and pitch, turpentine and oyle of turpentine and rozen, will be furnished, but also the deal boards, masts, yards and bowsprits, and all the larger sort of ship timber for the King and all his Dominions: and taking one thing with another, I can demonstrate that all these commodities I have now named will be afforded cheaper to England, than they now are from forreign Countries. Deal Boards are what will turn to least account of any of the Commodities I have enumerated, yet a vessel wholly laden with them would make a saving voyage from these Plantations to England. The Deals brought from Norway are sold by tale, that is by the hundred, and the price is from £3 10s, to £5 the hundred, their length from 10 to 12 foot, their breadth from 10 to 12 inches. In New Hampshire they sell their boards by the 1,000 foot, 22 shillings per 1,000 is the present price for such deale, the boards are rarely under 25 foot in length, and from 15 to 18 inches in breadth, and more free from knots than the Norway boards are, as they tell me here; when the deals are 2 inches thick they call 'em plank, and their rule is, to double their price, as the thickness of the board or plank doubles; for 2 inch deale they have £2, 4s per 1,000 foot, and for 3 inch deale £3, 6s, and the advantages to the merchant or fraghter will be chiefly in the 2 and 3 inch deal plank for the decks of ships, and such planks as they saw in New Hampshire of 36 foot long and two foot broad, and upon occasion they can furnish plank that's longer and broader than even that. . . .

I desired Mr. Bridger[5] to give me the prices of the principall ship timber, (as sold in the King's Yard at Portsmouth where he serv'd his time) which are contained in the paper (marked F) but he told me he had put very moderate prices on the several

[5] John Bridger was first Surveyor General of woods in America.

sorts. And for instance he told me he had known 5 shillings per foot paid for greater standards in a first and second rate man of war which would be £15 per load, yet he had set down pine £7 10s, per load in his said paper which is but half a crown a foot. At the end of his memorial (marked D.) which answeres my queres, he undertakes to save the King £2,930 19s, for every ship load of masts, of what is paid to Taylor, and a ship making its voyage in a year from Pescattaway to England, the King will gain £5,861 18s sterling, & two such ships of his own will gain him £11,723 16s every year if the Navy will require so many masts.

That the masts, yards and bowsprits for the King's ships will be best and cheapest carryed home in ships of the King's own is very clear and manifest. And I believe I shall as easily make it appear that the great and principal ship timber for building his ships of war, viz^{t} beams, plank and compass timber (taking one sort with another) will be sent home in the King's own ships for very near half the price those sorts of timber cost the King at this time in his yards. . . .

All the masts and scarce sorts of ship timber for the use of all England, and the rest of the Dominions of the Crown, will be furnished from these Plantations cheaper than they now sell in England, taking one with another. And with a good regulation here will be a lasting store of all these things to the end of the world. This Province and New York abound with excellent ship timber of all sorts and so does Connecticut Colony, as well as New Hampshire. . . .

Mr. Partridge's[6] folly in discovering what a proffitable voyage his ship formerly made to Lisbon, of which he crack'd to every body, (viz) that for less than £300 this mony, he clear'd £1,600 in the market he met with in Lisbon, for his ship timber, has set all the country agogg, so that some of the Merchants of Salem are now loading a ship with 12,000 foot of the noblest ship timber that ever were seen in America. 6,000 foot of 'em are 4 inche plank and 6,000 3 inch plank and 45 foot long, and scarce a knot in any of 'em, they were designed also for Portugal, but I have taken such a course, as that the King shall have 'em of the Merchants carrying, or of my sending. I have spoke to one of the owners, and told him I would not suffer any ship timber to be sent to a foreign country; and that he and his partners must resolve either to send their ship and timber to England upon the same terms Mr. Partridge has oblig'd himself to do, or sell the timber to me for the King at the price it stands them in, and the merchant has promised it shall be so. He own'd to me it was the best plank that ever was seen in America and of such dimensions that tho' their ship be of 250 ton, she would not carry at most above 2,000 foot more of such plank. . . . [Dated Boston, June 22, 1700.]

Taxes were commonly paid in lumber or provisions at fixed prices, with a discount of one-third if paid in money. According to the "Annals of Portsmouth," with silver at 6s 4d an ounce, these prices in 1680 were as follows:

Merchantable white pine boards	30s per M.
White Oak Pipe staves	£30 per M.
Red Oak ditto	30s per M.
Red Oak hhd. staves	25s per M.
Indian Corn	3s per bu.
Wheat	5s per bu.
Malt	4s per bu.

Presumably, the above table, quoted precisely from the "Annals," is in error as to the price of white oak pipe staves.

The second Surveyor General of woods in America was Dunbar, who

[6] Partridge was Lieutenant Governor of New Hampshire and, contrary to Bellomont's warnings, had sent ship timber to Portugal with great profit to himself.

was Lieutenant Governor of New Hampshire. Surveyor General Bridger had, apparently, been lenient in his administration, but Dunbar distinguished himself by extreme severity. Belknap's "History of New Hampshire" says: "The rigid execution of the office of Surveyor General had always been attended with difficulty and the violent manner in which Dunbar proceeded with trespassers raised a spirit of opposition on such occasions. The statutes for the preservation of woods empowered the surveyor to seize all logs cut from white pine trees, without license; and it rested on the complainant to prove his property in the court of admiralty. Dunbar went to the sawmills; where he seized and marked large quantities of lumber, and, with an air and manner to which he had been accustomed in his military capacity, abused and threatened the people. That class of men with whom he was disposed to contend are not easily intimidated with high words; and he was not a match for them in that species of controversy, which they have denominated 'swamp law.'"

Riots and forcible resistance to the Surveyor General followed and his very name inspired an animosity which is reflected in the annals of more than one colony.

The population and industrial strength of New England increased rapidly during colonial times, although in the latter part thereof hampered by hostile legislation in the English Parliament. Farming was the most important industry, but next came the fisheries. At the close of the colonial period the cod fisheries alone employed 665 vessels and the whale fisheries 120. Other important industries were shipbuilding and the manufacture of forest products. In 1770 the exportation of masts, boards, staves, etc., from New England was valued at £45,000; ships, about 70 sail, at £49,000, and potash, to the amount of 8,000 barrels, at £20,000. These three were dependent upon the forests. The trade was largely with the West Indies, Madeira and the Canaries, as far as lumber and staves were concerned.

Shipbuilding was an important industry at an early date; many ships being built for the French and Spaniards who paid for them in rum, molasses, wines and silks.[7]

It is evident, from what has been said above and from all the records, that the most important lumber shipping port of the colonies during the Seventeenth Century was that of the Piscataqua River. During the ten months ended April 12, 1681, according to statements made by the King's Council to the Lords of Trade, there were entered at that port "twenty-two ships, eighteen ketches, two barkes, three pinks, one shallop, and one flyboat, in all forty-seven."

In a description of the Piscataqua region, written soon after 1650,

[7] Elliott's "History of New England," Volume II.

the following is found: "At the falls of Nichiquiwanick three excellent sawmills are seated, and there and downward that side of the river have been gotten most of the masts which have come for England and among the rest that admired mast which came over some time last year containing nere fifty tunes [tons] of timber, as I have been informed."

In 1681 the report of the King's Council said, in regard to the lumber business on the Piscataqua at that time: "The trade of the province is in masts, planks, boards and staves and all other lumber."

A comment on the condition of the colonies at the middle of the Eighteenth Century is found in Volume II of Elliott's "History of New England," as follows: "The colonies were all prosperous and increased rapidly in production and trade." George Whitefield, who itinerated through New England between 1740 and 1750, says: "Never, surely, was a place so well settled in so short a time. The towns all through Connecticut and eastward in the province of Massachusetts, are large, well peopled and exceedingly pleasant to travel through. Every five miles you have a meeting house." Dr. Douglas, writing about 1750, said:

New England abounds in Saw-mills of cheap and slight work; generally carrying only one saw; one man and a boy attending, a mill may, in twenty-four hours, saw four thousand feet of white pine boards; these boards are generally one inch thick and of various lengths, from fifteen to twenty-five feet, and of various widths, one foot to two feet at a medium; it is reckoned that forty boards make one thousand feet. These mills stand upon small streams, because cheap fitted, but with the following inconveniences. 1. As the country is cleared of wood and brush, small streams dry up. 2. In living small streams, they do not afford water sufficient to drive the wheels in summer. 3. In winter they are frozen up.

According to this writer, a considerable source of profit for the sawmills at this period was the contracts with the commissioners of the Royal navy, as well as in preparing lumber for the West India and other markets. There was a surveyor of his Majesty's woods, whose deputies surveyed and marked the logs at the mills, for which they received a perquisite from the lumberman.

A footnote in connection with the above says:

By the term *lumber*, was generally meant, in America, ranging Timber, Spars, Oak and Pine Plank, Oak and Pine Boards, Staves, Heading, Hoops, Clapboards, Shingles, Laths. In the Act of Parliament of 1722, extending the operation of previous laws for encouraging the importation of Naval Stores, the different kinds of lumber were specified, viz; Deals of several sorts, Timber Balks of several sizes, Barrel-boards, Clap-boards, Pipe-boards, or Pipe-Holt, White-boards for Shoemakers, Boom and Cant-spars, Bow-stoves, Caprevans, Clapholt, Ebony-wood, Headings for pipes, Hogsheads, Barrels, Hoops for Coopers, Oars, Pipe and Hogshead-staves, Barrel-staves, Firkin-staves, Trunels, Speckled-wood, Sweet-wood, small spars, Oak, Plank and Wainscot. The Commissioners of the Navy in making their contracts, which were usually given to Piscataqua, N. H., and Casco Bay, Mass., specified the kind and number

required, and gave a license for cutting the trees, and none could be cut without. Masts were usually required to be 38 inches at the butt, and as many yards long. The premium was one pound per ton of forty feet girt measure. Timber under twelve inches, was called Ranging timber; those above 12 inches, Tun timber; Steads and Kines, were called Compass timber.

All through the colonies lumber was an important commodity, but what are now Massachusetts, Connecticut and Rhode Island were more especially agricultural districts, while forest products were of more importance in the north, with Portsmouth as the center of the trade until the white pine had been cut away from the Piscataqua River and its tributaries.

The following is a fragmentary record, by some chance preserved in available form, showing the exports of forest products from New England, for one of the earliest fiscal years under the Constitution. By that time Massachusetts had reached the preëminence among the New England states it has since maintained, though it should be noted that Maine was then a district of Massachusetts, which, therefore, secured the credit for its large lumber exports.

NEW ENGLAND EXPORTS FROM OCTOBER 1, 1791, TO SEPTEMBER 30, 1792.

	New Hampshire.	Massachusetts.	Rhode Island.	Connecticut.
Pine boards and planks, feet	7,457,500	28,114,375	281,676	570,083
Oak boards and planks, feet	330,650	350,985	.....	18,852
Other boards and planks, feet	10,400	264,874	.....	.....
Scantling, feet	.....	525,350	21,440	4,000
Timber, feet	.....	253,573	14,400	65,000
Timber, tons	539	18,249	70	9½
Timber, pieces	.....	6,745	70	.....
Lignum-vitæ, tons	.....	.....	16.4	.....
Staves and headings, pieces	1,250,100	5,257,475	277,950	1,124,842
Shingles, pieces	1,209,000	14,386,700	110,000	325,800
Hoops and poles, pieces	36,150	1,232,481	314,813	573,605
Shooks, pieces	1,459	32,634	1,916	5,133
Masts, pieces	79	210	.....	.....
Spars, pieces	11	2,565	790	12
Cords of wood, pieces	.....	1,073	12	.....

Also 23 other classifications in small amounts.

In this brief review of the colonial conditions in New England in respect to the timber and lumber industry no attempt has been made to go into detail, the object being to show general conditions and general governmental policy. The facts regarding the various colonies and states will be more specifically treated under their respective titles.

CHAPTER II.

MAINE—EARLY LUMBER DAYS.

Some time in the middle of the Nineteenth Century a Bangor schoolboy, having been asked to name the principal crops of Maine, promptly replied, "Lumber, ships and sailors," and his summary of the State's resources, seemed, at the time, to be fairly comprehensive. Since then Maine has gone into many enterprises and prospered in most of them, but the lumber industry is still the chief dependence of her people and seems altogether likely, in its various branches, to continue for generations as their principal occupation and the State's greatest source of wealth, although there is not a township within its boundaries that has not been lumbered to some extent. According to the census of 1900, cotton goods stood first in point of value among the manufactured products of Maine, representing, for the year 1899, $14,631,086, while the products of the sawmills and timber camps were second, being valued at $13,489,401; products of woolen mills were third, $13,413,784, and paper and wood pulp fourth, $13,223,275.

With the present immense diversion of timber to the pulp mills there would seem to be little chance of an increase in the products of the sawmills, and the wonder is that the latter have held their own against the new log-eating octopi—the grinders and the digesters. Still the census figures show that the value of sawmill products increased 13.8 percent in the decade from 1890 to 1900, while the increase was still greater in the five years succeeding the twelfth census, the comparative figures for 1899 and 1904 showing an increase in the latter year of 14.7 percent in quantity and 38.3 percent in value. The value of sawmill products is closely approached by that of the woolen mill and pulp and paper mills; but, if to the sawmill output should be added that of the planing mill and the box factory, not to mention the great variety of other woodworking establishments, the total would be enough to put these closely associated industries securely in the lead for second place in regard to value of products with small prospects of ever being ousted therefrom, if, indeed, they would not occupy the first place.

In drawing comparisons between the value of the products of the forests and those of the textile mills, it should be remembered that while all of the cotton and most of the wool manufactured in Maine are brought from other states, the woods grow at home; and while the textile mills

are largely owned by nonresidents, the sawmills and woodworking plants and many of the pulp and paper plants are owned by Maine men—conditions which must be taken into account when estimating the worth of an industry to the locality where it is established. Logs, from the time when they are chopped in the woods to the final process of manufacture, are a never-ending source of profit, a constant and progressive medium for the distribution of wealth.

In 1890 Maine had 894 sawmills and timber camps, employing 11,540 hands, while in 1900 the number had decreased somewhat more than six percent, to 838, and the number of employees about forty-one percent, to 6,834. The falling off in both cases resulted from a great improvement in manufacturing methods—modern band mills having taken the place of small mills that were equipped only with gang and circular saws. The new plants are fitted with all sorts of labor-saving and time-saving appliances. The result of these changes is that, even with fewer mills and fewer men, the product's value increased nearly fourteen percent in the decade from 1890 to 1900, while, despite the great reduction of 41 percent in the number of employees, the total of wages decreased but 2.4 percent. The half decade between the twelfth census and the industrial census of 1905 showed a sharp upturn in the magnitude of the business, with the heaviest increases not in the numerical constituents of the schedules, but in values. The number of establishments increased during the five years 16 percent, and the number of wage-earners 24½ percent; but the capital increased more than 18 percent, the value of products 38 percent, and the wages paid 58 percent. Dispensing with subdivisions and classifications and giving the forests of Maine their due, it will be found that wood products, exclusive of pulp and paper, lead all others, representing, in 1900, 12.2 percent, or nearly one-eighth, of the total value of all manufactures in the State. Add pulp and paper, which, coming from the forest, should be credited to the forest, and the total will be vastly in the lead of all others.

RESOURCES IN FORESTS AND WATER POWER.

Two of Maine's greatest natural resources are its forests and its water power. Of the 33,039 square miles of area within the limits of the State 3,145 are covered by water; and, of the land surface, nearly two-thirds, aggregating about 20,000 square miles, or upwards of 12,000,000 acres, is still covered by forest growth. The ax of the lumberman has made inroads into this great domain, and yet the growth of standing timber is so rapid in this climate that, where discretion is shown by the operators, the lands may be gone over at frequent intervals for many years. The virgin pine is now largely gone, but spruce is everywhere to be found, while hardwoods abound in many localities. Maine is no

longer the "Pine Tree State"—for spruce is now king, the forests of that timber stretching far north to the Canadian line and promising to be far more valuable than the pine ever was. Into this great forest might be dropped the states of Massachusetts, Connecticut and Rhode Island and there still would be fringing each a margin of wilderness sufficiently dense to make its exploration without a compass a dangerous undertaking.

In the matter of water power, no other territory of like extent anywhere is so favored as is Maine. The 1,620 lakes have an area of 2,300 square miles; and, when this is supplemented by the 5,151 rivers and streams shown on the State map, Maine's inland water surface is 3,145 square miles—more lake surface than has a million square miles of the United States in the West and South. An important feature of Maine's lake system is the myriad connections of the lakes with the rivers, from which fortunate circumstance they can readily be transformed into receptacles of manufacturing power, and may, with improvement, contribute greatly to the prosperity of the State. Another important feature is the location of so many of these lakes at or about the heads of the rivers and at a considerable elevation above the sea. According to the hydrographic survey of Maine, the 1,229,200,000,000 cubic feet, more or less, of water annually delivered by the rivers falls on its passage to the sea through the mean distance of 600 feet and yields 4,429 horse power for each foot of fall. This, being multiplied by the total average fall in feet gives 2,656,200 horse power, gross, which is equivalent to the working energy of over 34,000,000 men. A reliable approximation of the amount available would be between 1,000,000 and 2,000,000 horse power, but this could be increased very materially by improvement of the natural storage basins around the headwaters of the rivers. Much has been done in this direction in the last few years and further important works are in progress or under consideration.

The area of Maine is 33,039 square miles—only 1,306 square miles less than the area of the five other New England states combined. It is a hilly region, and at the north and west it is mountainous. The coast of Maine was early visited by the Cabots, Verrazani, Gosnold, Pring and other explorers. The first attempts at colonization were by the French in 1604, and by the English in 1607. The first permanent settlement was made in 1623. In considering the history of Maine it should be remembered that the colony was merged into "The Province of Massachusetts Bay" in 1691, and remained a part of Massachusetts until 1820, when it became a state.

The original pine growth of Maine was from near the coast to an altitude of 800 to 1,000 feet; above that grew the spruce, though both species were more or less intermixed. It is said the only virgin pine

left in Maine is in the northern part of Piscataquis County, on St. John waters.

W. D. Williamson's "History of Maine," Volume I, page 106, published in 1832, reports the following trees common to that State:

White ash (*Fraxinus excelsior*); black ash (*Fraxinus americana* or *sambucifolius*); beech (*Fagus*); basswood (*Tilia americana*), the same as linden or lime tree; birch (*Betula*), four species—white (*Betula alba*), black (*Betula nigra*), yellow (*Betula lenta*) and alder (*Betula alnus*); buttonwood or sycamore (*Platanus occidentalis*); butternut (*Juglans cathartica* or *Juglans alba*); white cedar (*Thya* or *Thuia occidentalis*); red cedar (*Juniperus virginiana*); cherry-tree (*Prunus virginiana* or *cerasus*); black elder (*Sambuccius nigra*); elm (*Ulmus americana*); hornbeam (*Carpinus betulus*); juniper (see larch); white maple (*Acer negundo*); red maple (*Acer rubrum*[1]); black or rock maple (*Acer saccharinum*); black oak (*Quercus nigra*); red oak (*Quercus rubra*); white oak (*Quercus alba*); chestnut oak (*Quercus prinus*); shrub oak (*Quercus pumila*); wild plum tree (*Prunus sylvestris*); white pine (*Pinus strobus*); yellow pine (*Pinus pinea*); pitch pine (*Pinus tæda*); larch (*Pinus larix*); fir (*Pinus balsamea*); hemlock (*Pinus abies*); spruce (*Pinus canadensis*); aspen or white poplar (*Populus tremula*); balsam or black poplar (*Populus nigra*); sassafras (*Laurus sassafras*); leatherwood or Indian wickape (*Dirca palustris*); swamp or white willow (*Rhus toxicodendrum*); white willow (*Salix alba*).

"The largest and heaviest trees in our forests," says that writer, "are the white pine, the hemlock, the elm, the maple, the birch and the buttonwood. The next class in size embraces the oak, the birch, the basswood and the ash. The third class is the larch, cedar, fir, spruce and poplar. The oldest trees are the oak and pine; for by their annual ringlets, formed between the wood and the bark, it has been ascertained that some of them have been growing between 500 and 1,000 years."

DEVELOPMENT OF LUMBER MANUFACTURE.

The associated abundance of forests and water power impressed the earliest settlers of the State, who almost immediately improved, in a small way, the opportunity offered, and embarked in manufacturing. As early as 1631 the cutting of timber had become an established occupation, and in 1634 a ship was loaded at what is now South Berwick, on the Piscataqua River, with pine clapboards and oak staves for England. The "History of American Manufactures" says: "The number of sawmills in Maine in April, 1682, was twenty-four, of which six were at Kittery. Wells was the second town in the extent of its lumber business, and Falmouth (now Portland) was the third."

All through the colonial period lumbering was carried on to some extent on the rivers from the Piscataqua to the St. Croix, small mills fitted with crude machinery brought from England being erected at points convenient to navigable waters, while many pine masts and spars were cut for the merchant and naval ships of the mother country. Pine was

[1] *Acer saccharinum* Linnæus.

the chief timber cut, as that growth was the most plentiful, although the cutting of oak and hackmatack for shipbuilding purposes was a considerable industry in early times.

To prevent the destruction of innumerable white pines yet standing on public lands, by far the noblest trees in the eastern forests, the Legislature, in 1784, made it penal in the sum of $100 to cut one of them, recoverable by indictment. It also forbade by a perpetual law the exportation of any other than square edge boards or any shingles other than such as were eighteen inches in length and entirely sound, and required towns to choose surveyors of lumber. Pot and pearl ashes, and fish, being articles of exportation from Maine, inspectors of them were, by a statute of 1784, required to be appointed for the benefit of the trade and the encouragement of the exporters.[2]

The "History of Maine" said of a period as early as 1792:

"The rage for multiplying municipal towns, and new settlements—in entering upon wild land and lumber speculations, appeared to admit, as yet, of no abatement. Efforts so energetic to people a new country, were such evidences of enterprise and fortitude. The District [of Maine] was still abounding with unoccupied mill sites—hundreds of which were in the heart of heavy timber tracts; and there was great interest taken in converting wild lots, which cost little or nothing, into places of culture and habitation."

Federal statistics do not credit Maine with a single sawmill in 1810[3] in spite of the fact that the manufacture of lumber had been in progress in that State in a pioneer way for 180 years, and by 1816 the product of the Penobscot River mills alone reached 1,000,000 feet. "Maine, at the separation in 1820," said the *North American Review*, in 1844, "we know contained 746 mills for the cutting of lumber and must have had full half that number in 1810." In 1832 the Penobscot output was nearly 40,000,000 feet, that river being then far in the lead of all others, having immense timber resources close by good water and the river being navigable for large vessels to Bangor at the head of tide water.

The law reports of the State of Maine, as late as 1829, contained a scrap of record showing the law to be in a quandary as how legally to convey a steam sawmill, since it was a very modern invention not down in the books, and only one was to be found in the whole country.

Official statistics credit Maine with 1,381 sawmills in 1840 and many of the larger mills appear to have been located on the Penobscot, as Penobscot County was credited with the largest manufacture, while several other counties exceeded it in the number of mills.[4]

[2] "History of Maine," W. D. Williamson, 1832.
[3] *North American Review*, Vol. LVIII, 1844.
[4] "History and Description of New England," Coolidge and Mansfield, 1859.

The entire lumber product of the State in 1840 was valued at $1,808,683. It appears also that, though Maine ranked fifth in the number of mills, it was exceeded only by New York among the states of the Union in the value of its lumber product.

In 1841 2,000 men were employed and $4,000,000 was invested in Maine lumber industries. In that year Maine shipped 200,000,000 feet of lumber, of which 100,000,000 feet was from the Penobscot, 40,000,000 feet from the Kennebec and 60,000,000 feet from all the other rivers. These shipments were valued at $2,000,000.

The *North American Review*, in 1844, in an article in Volume LVIII of that publication, said of the Maine lumber industry of that time:

> We should estimate the value of lumber manufacture in other parts of Maine as follows: Washington County, three-quarters of a million; Kennebec, one-half a million; Somerset, Waldo and York, one-fifth of a million each; Hancock, Lincoln and Cumberland, one-tenth of a million each; and the remaining counties at one-tenth of a million more—making the entire sum for the State, two and three-quarter millions of dollars. Although these estimates make up an amount nearly a million above the value, according to the returns for 1840, we consider them not too high; but, whatever the exact yearly havoc in their woods may be, Maine should take heed, lest the pine tree of her escutcheon do not become like the same device on the first money coined by her parent State, an emblem of her departed, rather than of her present, glory and pride.
>
> That in America—a country of stumps and newly cleared lands—apprehension should be expressed as to our capability of furnishing ourselves with timber for all coming time, will excite a smile on the faces of many. Be it so. John Jay, a man as wise as the wisest, and as good as the best, thus wrote to Washington, more than fifty years ago. "There is some reason to apprehend that masts and ship timber will, as cultivation advances, become scarce, unless some measures be taken to prevent their waste, or provide for the preservation of a sufficient fund of both." And this passage has the more weight as it occurs in a letter devoted to the suggestion of measures necessary to be brought forward for the good of the country. The usual reasons for forcing timber into the market are, that fires run through it and that trespassers plunder it. We answer, that the man who would destroy his house that it might not be burned, or waste his money that it might not be stolen, would hardly be deemed wise.
>
> We return to the woods of Maine, which yet remain her property and those of Massachusetts. The "mast trees," which, within three generations, caused such heated contentions, are gone; not one ever seen by a surveyor general of the King now remains. The lower waters of every considerable river are abandoned. But the sound of the logger's ax can still be heard from the memorable "island dividing the waters." A century in the history of the nation is but a brief space, for it scarcely marks the extreme duration of the human life. But he who visits the land lying around the tributaries of the St. John, a hundred years hence, will probably see them despoiled of their wealth. That event will doubtless occur, sooner or later; legislation can hasten or retard it. That Maine ought to endeavor to postpone it, we fully believe; the interests of Massachusetts may require another policy; she will judge. The treaty of Washington has given rights and guarantees which obviously demand such action on the part of both.

Of the subsequent history of the Maine forests, Austin Cary, A. M.,

forester to the Berlin Mills Company, said in a paper before the Boston Society of Civil Engineers, May 10, 1899:

The development of the lumber business has proceeded according to evident laws. In the natural condition pine was at once the richest, most valuable and most accessible timber that the State possessed; pine, therefore, was the first timber to be taken. It was taken, too, where most easily accessible, along the coast and on the banks of rivers, where it could be brought to mills, run by tide or located at the first powers above their mouths. As the best class of timber failed in the first locations, men pursued it further up the streams or spread along the coast to other regions which had not yet been drawn upon. For a long period, however, they cut only pine, even after they had to go long distances for it. In fact, the State had been settled nearly two hundred years, and the larger rivers had been culled for pine clear to their sources on the plateau [which stretches from west to east, dividing the area of the State into a northern and a southern slope] before there was a profitable market for other soft-wood timber. At length, however, the limits of the pine supply, a supply never so abundant per unit of area in the northern wilds as in the low-lying parts of the State, began to be approached, and spruce began to take the place of pine as the staple of the lumber export.

Since about 1840, then, the bulk of the lumber exported from Maine has been spruce, which was cut in the great forests of the plateau and sawed at mills located low down on the Penobscot, Kennebec and Androscoggin rivers. Since the early '70's, however, the sawmills have had a competitor in the log markets of the State in the shape of mills manufacturing wood paper. Beginning about 1870 in a small way, pulp and paper manufacturing rapidly grew, and in ten years had become well established. After a period of experimentation spruce wood was settled upon as by far the best, technically, for most uses, and it is now exclusively used in most mills. The amount thus used can be judged of from the mill capacity. In 1894 the pulp and paper mills of Maine numbered forty, and represented as reported to the State Labor Commission, an invested capital of $12,000,000. They employed between 4,000 and 5,000 men, and had a daily capacity of 397 tons of paper and 765 tons of pulp. At the beginning of 1899 the mills of Maine reported to the directory of the trade a daily capacity (not production) of 650 tons of paper and more than 1,000 tons of pulp. In this respect Maine stands second only to New York among the states of the Union.

Here we get at what is at once the big and pressing matter in connection with the forests of Maine. Paper making is one of the great, staple and growing industries of the country. It is mainly dependent on spruce wood because spruce excels in length and strength of fiber, and is most readily reduced to the macerated condition. Now, the woods of Maine possess the largest stock of spruce wood existing within the limits of the United States, while probably in a still greater degree they embody growing capacity. The question what those resources amount to, the question, too, how it is being used and what may be done to foster it are questions of concern to the whole country.

The number of sawmills in Maine in 1859, specifically enumerated in the "History and Description of New England", by Coolidge and Mansfield, published in that year, was 719. Their locations by counties are here given as they were enumerated in that work. The number of mills, however, considerably exceeded this total, as the Federal census of 1860,

the data for which were probably gathered at about the same time, credits Maine with 926 mills. It is likely that the figures of Coolidge and Mansfield were complete so far as they went, but that unenumerated towns made up the deficiency. In every county given, are mentioned other towns containing sawmills, but the number is not given. The following are the mills enumerated in the history mentioned:

Androscoggin County—Auburn 5, other towns 30; total 35.

Aroostook County—Several towns 7.

Cumberland County—Brunswick 7, Standish 8, Windham 8, other towns 37; total 60.

Franklin County—Several towns 25.

Hancock County—Ellsworth 9, other towns 31; total 40.

Kennebec County—Augusta 30 saws and 1 gang of saws, Gardiner 6, other towns 27; total 33.

Lincoln County—Several towns 32.

Oxford County—Norway 7, Rumford 6, Woodstock 5, other towns 46; total 64.

Penobscot County—Bangor (number not given), Bradley 17, Hampden 15, Oldtown 59 single saws and 12 gangs, Orrington 7, other towns 61; total 100.

Piscataquis County—Several towns 24.

Sagadahoc County—Several towns 10.

Somerset County—Fairfield 28, other towns 27; total 55.

Waldo County—Searsmont 15, Waldo 8, other towns 56; total 79.

Washington County—Calais 18, East Machias 16, Lubec 9, Machias 16, other towns 29; total 88.

York County—Biddeford 5, Hollis 7, Sanford 7, other towns 48; total 67.

Abbott and Elwell's "History of Maine," published in 1892, said of the condition of Maine's forests at that time:

These cover the northern portion of the State, and comprise 12,000,000 acres, or 62.7 [percent] of its entire territory. Of this percentage 22.4 percent is in farm lands and the remainder in wild lands. The entire forest area of New England is but 19,193,028 acres, of which it will be seen Maine possesses nearly two-thirds. Originally, her forests abounded in pine, which, at one time, was considered almost the only timber worth cutting. As a consequence the pine has greatly diminished, yet the product is still large and quite constant; in 1888 over 29,000,000 feet of pine timber was surveyed at the port of Bangor, and this is not far from the average yearly survey for the years since 1860.

As the pine has diminished other woods, once thought to possess no commercial value, have come into use, notably spruce, birch, maple and other hardwoods. Great quantities of softer woods are consumed in the manufacture of paper pulp, and birch is worked up into spools. New uses for what once were considered nearly worthless woods are constantly being found, thus adding to the value of the forest product. . . .

The State has unwisely parted with all its wild land. It is now largely held by private owners, in immense tracts, often comprising one or more townships. These owners clear no land, and sell no land, thus obstructing its settlement and the making of roads. The forests must remain an important source of commercial and industrial importance to the State. Their preservation has, therefore, become a matter claiming the attention of its people, and the demand is now made that great precautions shall be taken against fires. Trees below a certain size are not allowed to be cut, a condition

which enters into the landholder's leases to the loggers. The art of forestry must henceforth demand the attention of all interested in the preservation of one of the great resources of the State.

EARLY TIMBER LAND TRANSACTIONS.

Much of the State's timber land was disposed of, while Maine was a part of Massachusetts, in grants to various persons, to soldiers of the Revolution and of the War of 1812 and as aid to colleges and academies. A great deal of land was given to actual settlers prior to 1784, in lots of 200 acres each, with 100 acres additional under certain conditions. In this connection the history of the so-called "lottery townships" of the State will be of interest.

In 1786 there was created by the Legislature of Massachusetts, a lottery commission composed of Samuel Phillips, Leonard Jarvis and Rufus Putnam, whose duty it was "to establish a lottery for the purpose of bringing into the Publick Treasury the sum of £163,200 in Publick securities by sale of a part of the Eastern Lands."

These lands comprised fifty townships in what is now Washington and Hancock counties. General Rufus Putnam, one of the younger of the officers of the line in the Revolution, who distinguished himself as an engineer and drew the favorable attention of General Washington, was the surveyor. He lotted these lands uniformly and, we have reason to believe, in a careful manner, at least as far as the exterior township lines are concerned. It is probable, however, and recent investigation in locating by bounds the ownership in severalty in these townships would tend to bear out this theory, that the interior lines of the townships were largely "paper lines," or wholly imaginary. General Putnam afterward became the first settler of Marietta, Ohio, where he died in 1839, being the last general officer of the Revolution to pass away.

The lottery tickets were sold at a fixed price. W. D. Williamson, an historian of Maine, says that the price was £60 a ticket, but another statement seen recently says that a much lower price was asked for these tickets. The grand prize was one township, No. 42 Middle Division, Washington County, a township that to this day, it is stated, is one of the best timber tracts in Washington County. However, that township was not drawn, the ticket for it not being sold. In fact, not one-quarter part of the tickets was sold.

The largest prize drawn fell to William Dall, of Boston, and consisted of 5,440 acres in township No. 19, Eastern Division, now in Washington County. The second largest fell to Rev. Elisha Fuller, of Ludlow, Massachusetts, being 3,840 acres in Township No. 2, North Division, now Grand Falls Plantation, Penobscot County. This lottery, it seems, proved a popular speculation for ministers, for it is found that Rev. Israel Fuller,

of Charlestown, Rev. Ephriam Judson, of Taunton, Rev. Daniel Fuller, of Gloucester, Rev. Joseph Williard, of Wilbraham, and Rev. John Murray, of Newburyport, all purchased tickets and drew land. Rev. John Murray, the last named, in partnership with William Lithgow, of Georgetown, Lincoln County, purchased no fewer than five tickets, but they nearly all drew only the minimum prize of 160 acres. "The president and Fellows of Harvard College" purchased no fewer than eight of these tickets, but were not successful in drawing any large prize. Nearly all of the purchasers of tickets were residents of Massachusetts; only four, in addition to William Lithgow above mentioned, were residents of what is now Maine. These were Waterman Thomas, of Waldoboro, Lincoln County, who drew 640 acres in Township 24, Middle Division; Nathan Nales, of Turner, Cumberland County, who drew 640 acres, Township 5, South Range, North Division; Jeremiah Loyd, of Berwick, York County, who drew 320 acres in Township 21, Eastern Division, and Robert and Alexander Barr, carpenters of Portland, Cumberland County, who purchased three tickets. Nothing could show more plainly the lack of money existing in the District of Maine at that date than that only five persons from that district felt able to participate in so popular a scheme as a lottery presented to the public mind 120 years ago.

The greatest transfer ever made of Maine timber lands was effected in what is known as the "Bingham Purchase," by which, in 1793, William Bingham, a wealthy Philadelphian, became possessed of 2,107,396 acres at 12½ cents an acre. This included what is now known as Bingham's Penobscot Purchase, in the counties of Hancock and Washington, between the Penobscot and St. Croix rivers, and Bingham's Kennebec Purchase, in Somerset and Piscataquis counties.

John E. Hobbs in an article, "The Beginnings of Lumbering in the New World," in the *Forestry Quarterly* for March, 1906, gives the following version of this lottery and connects it with the Bingham Purchase:

> A land lottery scheme was devised to dispose of fifty townships. In the scheme there were to be 2,720 tickets of £60 each. If the tickets all sold the aggregate would bring in £163,200 or $815,000. Against these there were to be put into the wheels these fifty townships of six miles square, equal to 1,107,396 acres of land, and every ticket would entitle the holder to a prize—the lowest to be half a mile square and the highest a township. A considerable part of the tickets was sold, and, at the time of drawing, William Bingham, of Philadelphia, took what lands the ticketholders did not draw, and bought in afterward the greater part of their prize lots. At one time Bingham's heirs owned 2,350,000 acres of these lands—a territory nearly half as large as the State of Massachusetts [though now they have been mostly disposed of]. The State had disposed of 3,500,000 acres in twelve years after the close of the war.

TIMBER TRANSACTIONS UNDER STATEHOOD.

When the separation occurred between Massachusetts and Maine in

1820, it was agreed that the wild lands owned by the former should become the joint property of both states, and commissioners were appointed on the part of each state to have them surveyed and divided upon this basis of equal ownership, a work that extended over a number of years. By this division the State of Maine came into possession of between 6,000,000 and 7,000,000 acres of wild land. In 1853 Maine bought from Massachusetts, for the sum of $362,500, all the remaining wild lands in Maine owned by that Commonwealth, amounting to something over 1,000,000 acres. It will thus be seen that since Maine became a State it has, first and last, owned about 8,000,000 acres of wild land.

The acts and resolves for the various years show that Maine was no sooner a State than it began disposing of its public domain. The importance of securing settlers to open the unsettled portions of the State were strongly urged in the messages of the early governors. Every possible inducement was offered the men who were willing to make their homes in the wilderness and convert it to agricultural uses. Notwithstanding these liberal inducements to settlers, the work of securing men who were willing to brave the hardships and discomforts of pioneer life went forward slowly. It seems almost incredible that the fertile lands of Aroostook, now constituting one of the finest agricultural sections of the country, went begging to such an extent that, upon the advice of Governor Chamberlain, the State was led, in 1869 and 1870, to try the experiment of Swedish immigration.

Grants of land were given for the establishment of grist mills and sawmills, the support and endowment of schools, academies and colleges, the building of country roads and bridges, "the support of the Gospel ministry." Generous grants were made to the soldiers of the Revolution and the War of 1812, and to their widows and orphans, also to the widows and orphans of the soldiers of the Civil War.

Indeed, lacking money, the State was led in its early days to secure the things it desired by the grant and sale of its lands, the income from which, for many years, constituted its largest source of revenue. As an example of this policy, which later generations have not hesitated to characterize as wasteful, it is interesting to know that the construction of the State House was largely paid for with State lands, the Legislature providing for the sale of twelve townships, the proceeds of which were to be devoted to this purpose.

Next to the encouragement of settlers, the early fathers of Maine legislated most liberally for the cause of popular education, immense tracts of the State's lands being sold, granted and set apart for this purpose.

By the processes noted the State rapidly parted with its wild lands,

until, in his inaugural message of 1859, Gov. Lot M. Morrill, noted the fact that only about 2,000,000 then remained of the 8,000,000 acres. This had been considerably further diminished when occurred the munificent gift to the European & North American Railroad, now the Maine Central. The history of this measure was thus stated by the Hon. Nelson Dingley, then a member of the Legislature, on February 29, 1868:

> In 1864 the State granted to this company vast tracts of lands to aid in building a railroad from Bangor to New Brunswick, provided that company would pay the debt then due Massachusetts on these lands, which, with the interest at time of payment, would amount to more than $280,000. The lands were supposed to be worth considerably more than this sum, and thus the road had the promise of this aid and also what it could get from Massachusetts and the general Government. Last winter the Bangor people interested in the road applied to the Legislature to remove the conditions under which the land was granted in 1864, and let the company have the same without paying Massachusetts. The Senate passed the bill, but the House finally refused to concur and the measure was lost. This winter the scheme was again brought before the Legislature, and the bill giving the road the land free and compelling the State to pay the $280,000 was duly reported and passed.

This is the only instance in which the State directly contributed to build a railroad, the value of the gift being at least $300,000. By this vote the State parted with the greater part of what was left of its once magnificent domain. By this act, as was stated by Governor Dingley in his inaugural address of January 8, 1874, the State gave away not far from 700,000 acres, valued at more than $300,000.

Out of the total of 8,000,000 acres of wild land that had once been held by the State, only 213,880 acres remained after the lavish gift to the European & North American Railroad. It is true that the title to 146,000 acres of settling land, which had been "taken up," but whose settlers had not fulfilled the conditions necessary to entitle them to deeds, was still vested in the State, as settlers here and there grew faint hearted and gave up their attempts to make homes in the wilderness. There was also a considerable body of lands which has been voted to certain public uses, and regarded as simply held in trust by the State for those purposes.

So strong was the feeling following this munificent gift to the European & North American Railroad, that there was a very general feeling throughout the State that there was no need of longer maintaining the land office. The land agent, Parker P. Burleigh, in his report of 1874, urged that it would not be good policy to abolish the office at that time. The act passed in 1874 abolishing the land office never went into effect, as it was found that the office was established by the Constitution and could be abolished only by vote of the people. In 1875, however, the matter was submitted to a vote of the people, and the office was abolished by a vote of 18,023 to 3,382.

The public land sales of 1874 and 1875 have been a target of considerable criticism. In his message of 1874, Governor Dingley advised the selling of the lands then owned by the State. A resolve was passed giving the land agent, under the direction of the Governor and his council, the power to do this, and, accordingly, there was an auction sale of lands in Bangor on September 23, 1874, at which 118,034 acres of land were disposed of. Another sale took place in Bangor October 28, 1875. Governor Dingley and his council were present and superintended the sale. A total of 96,110 acres were disposed of at this sale for $43,438.54. In addition to this the right to cut timber and grass on lots reserved in grants from the State were sold for $3,984.03. Some of the bidders at this sale failed to comply with its terms and a subsequent sale was held in Bangor, November 29 of the same year, at which the lands so forfeited, amounting to 5,324 acres, were sold.

The State has now sold most of its lands, and, until the advent of the pulp business, the ownership was widely scattered, there being few large proprietors. In the last twelve years, however, pulp companies have made large purchases, and two concerns, the Great Northern and the International, now own between 300,000 and 400,000 acres each. Several estates and some few men engaged actively in lumbering or in the buying and selling of lands have considerable holdings and the lands are held at a much higher figure than ever before. Llewellyn Powers, a former Governor of Maine, a few years ago owned about $700,000 worth of timber lands, which he purchased at half, or less than half, of that sum and of which he sold the greater part. The State sacrificed the bulk of its lands at trifling prices and the purchasers or their heirs are now reaping private wealth from the results of a public policy that was, to say the least, foolish.

The entire State has been surveyed into townships about six miles square, or of about 23,000 acres each. The line in the woods is marked by a succession of spots, or "blazes," upon trees standing upon or near the line, the spots facing in the direction in which the line runs and being cut at about the same height upon two sides of the tree. The corners, or turning points, are marked by stakes, stones and "witness" trees, so called, with spots freely "blazed" upon the sides toward the corner stakes. In this manner is marked the dividing line between one township and another, while in many towns interior lines have been run to mark the boundaries of separate ownership.

No controlling interest is acquired in land by majority ownership, but a legal partition may be had if the several owners in a tract disagree. Usually, some one of the owners of the land takes the lead in management, and what is called a "permit" is granted to the prospective operator.

This is a license to go upon the land and cut logs at a price agreed upon "per thousand feet board measure," which is supposed to mean a quantity of logs sufficient to saw out 1,000 feet of boards one inch in thickness but which, on every river in the State means a different quantity, governed by custom rather than by actual measurement.

PRESENT TIMBER CONDITIONS.

Illustrating the great changes that have occurred in the lumbering industry and how spruce has taken the place of pine, demonstrating, also, the great increase in the value of Maine timber lands, Hon. Albert W. Paine, of Bangor, who, at the age of ninety-three years was still actively engaged in the practice of law, in 1905 related an incident in his career sixty years previous in connection with some lands near what is now the boom town of Millinockett, known, because of its sudden and remarkable growth, as "the Magic City of Maine."

About 1845 Mr. Paine held for sale, as trustee of a bankrupt estate, a township of land near Millinockett, and, in order to ascertain its value, he sent an experienced surveyor to the township with instructions to make a careful examination. Offers ranging from fifty cents to seventy-five cents an acre had been made for the land, but Mr. Paine thought that it might be worth more. The surveyor was absent for some weeks and eventually reported that there was on the township about 1,000 feet of pine timber to the acre, and that the stumpage, or right to cut, was worth $1 a thousand, so that the whole township was worth about $22,040, which price he advised Mr. Paine to accept, and it was accepted.

In answer to inquiries as to whether or not there was any other timber on the township, the surveyor said: "Oh, yes, there is a vast quantity of spruce, so much that if the trees were to be cut down a man could go all over the town by jumping from one stump to another without ever touching the ground." Asked if the spruce were not of some value, the surveyor replied: "Value? No, it's a nuisance. The land would be worth more if there were no spruce there!"

"And so," said Mr. Paine, "I sold the land for $1 an acre, and the heirs of the purchasers, after receiving over a half million dollars in stumpage, still own the land, which, with its present growth of spruce (the pine having long since been cut off), is today worth not less than $4 an acre. This story is a good illustration of the character of timber lands in Maine. I once bought a large tract for fifty cents an acre, and after a few years sold it for $1 an acre. Today, after many millions of feet of timber have been taken from it, that same land is worth $3 to $4 an acre."

Hon. Edward E. Ring, forest commissioner of Maine, early in 1903 issued an estimate of the standing timber, particularly the merchantable

spruce, in that State. The work on which the estimate was based was divided according to the State watersheds, more attention being paid to the four great river systems, the St. John, the Penobscot, the Kennebec and the Androscoggin, than to the minor systems near the coast. The result of these explorations showed that there was standing in the forests of Maine at that time 21,239,000,000 feet of spruce, besides large quantities of pine, cedar, hemlock, poplar and various species of hardwoods. From deductions made by Ralph S. Hosmer, a field assistant of the United States Bureau of Forestry, it was determined that the annual growth was sufficient to warrant the cutting of 637,000,000 feet of spruce timber in the State of Maine each year without depleting the supply. Commissioner Ring said:

It is clearly apparent, therefore, that the forests of the State are amply able, by careful cutting, to meet the needs and requirements of the pulp and sawmills for an indefinite period, unless devastating fires and ruinous wind storms occur to cause damage and injury to the timber now standing and in process of growth.

The State of Maine is large in area, containing 33,000 square miles of territory. Of this area 21,000 square miles is forest land. There are 9,471,050 acres taxed by the board of assessors as wholly wild land, but this does not include all of the lumber producing land of the State. It is also true that, in addition to the land in the old incorporated towns that is actually timber-producing at the present time, there are large areas once used for agricultural purposes that have been allowed to go back to woodlands. In many instances the second growth is small and of little or no value for manufacturing purposes at present, but each year a certain percentage becomes available, and in the course of a series of years a large amount of lumber will be supplied from this source. Very little land is being stripped to such an extent that it will not furnish another crop of lumber from the undersized trees of the present stand in a comparatively few years.

Actual deforestation, except from forest fires, as I have stated, can never take place to any considerable extent in Maine, as the agricultural lands are very largely occupied. On the other hand, there is liable to be a constant increase in our lumber producing areas, on account of there being so little profit in cultivating dry, stony ground for farm crops, and more or less such lands are reverting to forest growth each season. On the whole, it is safe to reckon that there will be 11,000,000 to 12,000,000 acres of land in this State that will be lumber producing for all time.

Very nearly all the timber of Maine which has been used in the manufacture of pulp and paper has been taken from the drainage of the Androscoggin, Kennebec and Penobscot rivers. The proportion has been 42 percent from the Androscoggin, 33 percent from the Kennebec and 25 percent from the Penobscot. Practically, there has been none taken from the St. John's drainage or from the southeastern portion of the State in Washington and Hancock counties, both being large wild land regions.

The total acreage of these three systems, from which the whole pulp timber consumed in the State has been taken, is about 4,741,000 acres, leaving more than one-half of the entire wild land region from which no pulpwood of any consequence has ever been removed.

The average rate of increase or annual growth of spruce in the State varies according to the character of the soil and whether the trees have been thinned so as to allow

light and air to penetrate the forests, the actual percentage ranging from 2 to 4 percent. If 3 percent is taken as the average, which may be regarded as a conservative estimate, there should be an annual increase of about 637,000,000 feet.

The pulp mills, as now established, consume about 275,000,000 feet of spruce a year, besides considerable poplar, pine and hemlock, which are not considered in this calculation. This leaves for sawmill purposes about 362,000,000 feet, if we cut the annual increase alone, with other conditions remaining the same as in the past; but with improved methods of cutting and managing wild lands, which are being carefully studied, I am satisfied that the percentage of increase will gradually rise to at least four percent, which would add materially to our annual supply without decreasing the actual stand of lumber.

While my efforts to obtain a fair and reliable estimate of the standing timber in the forests of the State have been mainly directed to the ascertainment of the amount of the spruce supply, I have not lost sight of the fact that there are other woods growing upon Maine soil which are of inestimable value to the land owner and to the manufacturer. In the Kennebec section large quantities of poplar, valuable in the production of the best grades of paper, are found. Sapling pine and even pine of older growth may still be found in many sections of the State. Other varieties of soft woods grow upon our hills and in our valleys and all must be considered in determining the total value of the forest resources of our State.

Little is said or written of the white birch growth in the State, but one has only to look into the matter a little to learn that upwards of 35,000,000 feet of white birch timber are annually taken from our forests. The white birch area is a wide belt, that extends entirely across the State. White birch is used largely by the hardwood novelty mills of the State, yet its greatest utilization is in the manufacture of spools. The spool factories of Maine annually produce about 800,000,000 spools, valued at more than $1,000,000. Besides being used in the production of spools, much white birch is cut into spool bars for shipment to Europe. Other hardwoods are used to a greater or less extent in the manufacture of small articles, but the consumption of white birch leads the field in this particular line.

The extreme northern section of the State is included in the "St. John River system of Maine," which embraces the greater portion of Aroostook County and is the most prolific lumber territory in the State. This section comprises 7,400 square miles and in some parts of it there are great tracts of virgin spruce that have never known the woodsman's ax. Of this section Mr. Ring said:

Careful estimates made during the past season, taking each town by itself, from recent explorations, show that there are standing today on the land in the townships which drain into the St. John River system in Maine, 6,942,000,000 feet of spruce, 427,000,000 feet of pine, and 1,830,000,000 feet of cedar. This is exclusive of about 200,000,000 feet located on the headwaters of the Allaguash which will be turned into the East Branch of the Penobscot by a company now operating on those waters.

In the Penobscot River system, the timber now standing consists mainly of spruce, although the amount of cedar to be found in all parts is large. From the best estimates obtainable Mr. Ring said that there were then standing 5,166,000,000 feet of spruce, 438,000,000 feet of cedar and 153,000,000 feet of pine. He further said:

"The Kennebec River system, according to the reports of the explorers who have been employed during the past season to ascertain as nearly as possible the amount of spruce in this section, has 3,883,000,000 feet now standing, ready and suitable for lumber or pulp."

In the Androscoggin River system, Mr. Ring stated, there were 3,248,000,000 feet of spruce ready for cutting.

Of the ten minor river systems in the State, Commissioner Ring said:

> There are ten of these river systems, beginning at the New Brunswick border and extending along the southern coast of the State to the New Hampshire line, and though none of the systems is richly covered with timber, yet in the aggregate their timber resources are of much value and must be reckoned in the estimate of the amount now standing in the whole State. In the territory included in these systems there is a considerable amount of sapling pine, large quantities of which are being annually manufactured into box boards. At least 2,000,000,000 feet of spruce is available in the ten river systems outside the four large systems.

In Maine, as in other timbered states, there have remained small clusters of trees long after all of the land in the vicinity has been practically denuded; but they have been preserved by some peculiar circumstance more often than by any practical economic idea. Such a tract of timber was sold at Bangor in 1904. It was a part of 320 acres purchased by John Pierce and Daniel French from the General Waldo estate in 1802. As early as that date its value for lumber was appreciated. It included pine, spruce and hemlock and was located near the mouth of the Penobscot in the town of Prospect. Neither Pierce nor French desired to cut the timber, and it remained without change until the period immediately following the Mexican War, when the United States bought Pierce's part of the land and built Fort Knox. French, however, clung to his property and refused to have any of the pines cut, with the result that they attained a size equal to that of any of the finest pine ever floated down the Penobscot. But French died about fifteen years ago, and when his heirs sold the property, the forest was doomed.

THE SHIPBUILDING INDUSTRY.

The excellent mast timber available in Maine caused the early development of the shipbuilding industry in that region. Bath, for more than fifty years, ranked among the first six cities in the United States in ownership of tonnage. There are more than twenty shipyards on its two miles of water front and each of several firms has built more than 100 vessels. Its old fame rested on its wooden hulls, but while it still turns them out, its modern reputation is based on its fleet of steel vessels. At the Bath Iron Works have been built the battleship *Georgia*, the cruiser *Cleveland*, the monitor *Nevada*, the ram *Katahdin*, the gun boats *Castine*, *Machias*, *Newport* and *Vicksburg*, the torpedo boats *Dahlgren*, *T. A. Craven*, *Bagley*,

Barney and *Biddle*, the Sound-flyer *City of Lowell*, and the following well-known steam yachts: *Aphrodite*, *Eleanor*, *Pantooset*, *Virginia*, *Peregrine*, *Pillawara*, *Sapphire* and *Sagamore*, besides other notable craft.

Besides those at Bath, there are important shipbuilding facilities at Rockland, Camden, Bangor, Freeport, Portland, Yarmouth, Phippsburg, Waldoboro, Thomaston, Belfast, Bucksport, Millbridge, Machias, Kittery and eastern ports. Upriver towns such as Gardiner, Richmond and Hallowell on the Kennebec, Brewer on the Penobscot, Topsham on the Androscoggin, and Bowdoinham on the Cathance, formerly built large numbers of schooners and brigs, but the industry in those towns has largely disappeared. There has been a diminution of shipyards at the smaller coast towns such as Brunswick, Wiscasset, Harpswell, Damariscotta, Kennebunk, Castine, Boothbay, St. George and Brooklin, and the industry now is confined chiefly to the plants on the Kennebec and Penobscot rivers, Penobscot Bay, and to the coast towns east of the Penobscot.

It is recorded that of the ninety-six full rigged ships in commission under the Stars and Stripes in 1903, sixty were built in Maine, and between 30 and 40 percent of the barks were built in that State. At the same time, the largest steel sailing ship, American registered, was the *Atlas*, of the Standard Oil fleet, and this boat, measuring 3,381 tons, was built by the Sewalls. Two brigs, six masted, the *Eleanor A. Percy*, 3,062 tons, and the *George W. Wells*, 2,743 tons, were built at Bath and Camden, respectively. 29843

While it was the excellence of Maine's ship timber that first created the shipbuilding industry in that region, the yards there have undergone many changes in keeping with the industrial development of the country, until now the Maine forests contribute only an item to the ships constructed in the yards of that State. Other regions of the country have been drawn upon for material, and the use of steel and iron in shipbuilding has rendered the matter of a contiguous timber supply of less importance. A writer in the *New York Commercial* of October 31, 1904, says:

> The timber entering into the frames of the larger Maine schooners is generally white oak below the water-line and hackmatack above it. Most of the oak comes from Maryland and Virginia, but some is still cut in the Maine forests. At present the hackmatack comes largely from Canada, though a portion is still obtained in Maine. It is estimated that of the hackmatack knees used in shipbuilding in Maine at the present time about one-third is secured in Maine, while the other two-thirds comes from Canada. Southern hard pine enters largely into Maine shipbuilding and is used for planking, ceiling and sheathing. Spruce is used for ribbons, house frames, and so forth, white pine for finish, and Maine hardwoods for flooring and finish. All of the larger vessels are equipped with masts brought all the way from Oregon by rail, and the iron, cordage and oakum are outside products; but nearly everything else that enters into the construction of a Maine vessel, including anchors, chairs, windlasses, capstans, engines, boilers and miscellaneous fittings, is of Maine manufacture.

The fact should have been stated in the above quotation that southern pine is used also for framing as well as for planking, etc., although such use is exceptional. So well established is the shipbuilding industry of Maine that it may be predicted that as long as wooden vessels are built in the United States a large proportion of them will be the product of the experience and practical skill of the Pine Tree State.

CHAPTER III.

MAINE—LOGGING METHODS.

Before describing the methods used in conducting the logging and lumbering business of Maine, it may be well briefly to review the volume of the business and its subdivision into districts. The three principal logging states of New England—Maine, New Hampshire and Vermont—cut in a recent season (1901-2) 1,400,000,000 feet of logs, employing 40,000 men and 13,000 horses in the woods, at an expense in wages, horse hire and keeping of about $6,500,000. Of this aggregate cut, that accredited to Maine was 750,000,000 feet; to New Hampshire 500,000,000, and to Vermont 150,000,000 feet. Of the Maine logs about 550,000,000 feet was spruce, and a like or even larger proportion was cut in New Hampshire and Vermont. Of the Maine spruce, 300,000,000 feet went to the pulp mills; of the New Hampshire, 225,000,000 feet, and of the Vermont, 50,000,000 feet; so that of a total of approximately 1,070,000,000 feet of spruce cut in these three states, 575,000,000 feet went to the grinders and digesters and 495,000,000 feet to the saws.

Of the above logging product accredited to Maine, the following amounts were from the several districts respectively: The Penobscot, 210,000,000; Aroostook County (including the upper St. John in Maine), 125,000,000; southeastern Maine (including the St. Croix, Narragaugus, Machias and Union rivers), 64,000,000 feet; the Kennebec, 140,000,000; the Androscoggin in Maine, 135,000,000; the Saco, 17,000,000, added to which is the hardwood product cut over a wide territory and estimated at 59,000,000 feet.

The following is an estimate of the total logging operations in Maine for the winter of 1904-5:

Penobscot River—West Branch, 77,800,000 feet; East Branch, 69,000,000; Mattawamkeag, 25,000,000; Piscataquis, 25,000,000; Passadumkeag, 9,250,000; total, 206,050,000.

Kennebec River—Moose River, 39,500,000; Moosehead Lake, 36,500,000; East Branch and Maine River, 31,300,000; Dead River, 19,500,000; total, 126,800,000.

Androscoggin River—Operations in both Maine and New Hampshire aggregated 250,000,000, chiefly for pulp, and 50 percent transported by rail.

Saco River—About 20,000,000 feet, chiefly second growth pine.

Machias River—About 15,500,000 feet.

St. Croix River—25,000,000 feet.

Union River—13,000,000 feet.

Narragaugus River—7,525,000 feet.

Aroostook County—Allaguash, and St. John River above Fort Kent, 50,000,000. Fish River and lakes, 25,000,000; Aroostook River, 40,000,000; total, 115,000,000.

SUMMARY.

Penobscot River	206,050,000
Kennebec River	126,800,000
Androscoggin River	250,000,000
Aroostook County	115,000,000
Saco River	20,000,000
Union River	13,000,000
St. Croix River	25,000,000
Machias River	15,500,000
Narragaugus River	7,525,000
Total	778,875,000

Deducting logs cut on the headwaters of the Androscoggin in New Hampshire and credited to that river in the summary, the logs cut in Maine in 1904-5 scaled about 700,000,000 feet.

In the winter of 1905-6 the cut was about 150,000,000 feet for Vermont and 450,000,000 for New Hampshire. Maine's total cut, including all small operations, for the winter of 1905-6 was more than 800,000,000 feet. The proportion of spruce to the whole cut and the proportion of pulp to the entire spruce product were not materially different from the year cited above in detail.

A WOODSMAN'S LIFE.

Logging is carried on for a period of twenty-four to twenty-eight weeks, according to the weather conditions and the quantity to be cut. Formerly, no cutting was done until snow had fallen, but now the choppers begin early in the fall and a considerable part of the cut is "yarded" by the time enough snow has fallen to make good hauling to the "landings." The transportation of men and supplies to the woods has been greatly facilitated in recent years by the construction of railroads through the timber country and this has encouraged lumbermen to make an earlier start than formerly.

As a rule, chopping is well over by the last of January or the middle of February and the choppers then leave the woods. In a few places the logs are hauled directly from the stump to the landings, but more frequently they are "yarded," or piled up, in convenient places and hauled thence to the streams or lakes, down which they are floated or driven in the spring to the booms. The hauling season generally lasts well into March—sometimes as late as the middle of April, if there should be plenty of snow and much work to be done. On the last of the snow heavy supplies, such as hay and grain, pork and flour, are "toted" in for the following season's operations. This hauling is generally done by contractors at a stated price per ton. One concern, in 1903, paid at the rate of $11 a ton for the transportation over a distance of fifty miles of 100 tons of grain, hay and provisions, from which it will be seen that "toting" is an important element of cost in the lumbering industry.

During the summer the supplies thus stored are guarded by a camp keeper who lives at the camp, puts in his time at reading, smoking, fishing and hunting, and, having lived in peace, plenty and ease all the season, gets $50 or $100 in the fall for his "trouble."

Great changes have occurred in lumbering methods in the last fifty years. An old logger says:

When I first went to work in the woods, in 1854, only oxen were used for hauling, and no one thought of beginning operations until snow had come, so that supplies could be sledded in to the camps. For hauling logs a team of from four to eight oxen was yoked to a bobsled, a short sled with a single bar upon which was placed a heavy timber called a bunk, which served to strengthen the bar and prevent its being worn out. On this bunk one end of the logs was placed and securely chained, the other end dragging, so that the team moved the load by sheer strength. Then the logs, before being loaded, had to be barked—that is, the bark was hewed off from one side, so that they would drag along with greater ease. This used up a good deal of time and has been done away with by the use of wagon sleds.

There was no "yarding" of logs then, as today, all logs being hauled directly to the "landings." To load the sled for each trip the oxen were taken from the pole and used to drag the logs upon the sled—a very slow process. The sleds and yokes were made after the crew had arrived at camp, the sleds without a scrap of iron in them except the clevis pin at the end of the tongue. The yoke bows were brought into the woods, hung to the necks of the oxen; and, for the yokes, we hunted up crooked birch trees with the right bends in their trunks and hewed and shaved them into shape. With a pair of horses and the wagon sled in use today a man can do as much work as one could in the old times with a bobsled and eight oxen. The change to horses has effected a great saving, for the men move more quickly now and little time is wasted.

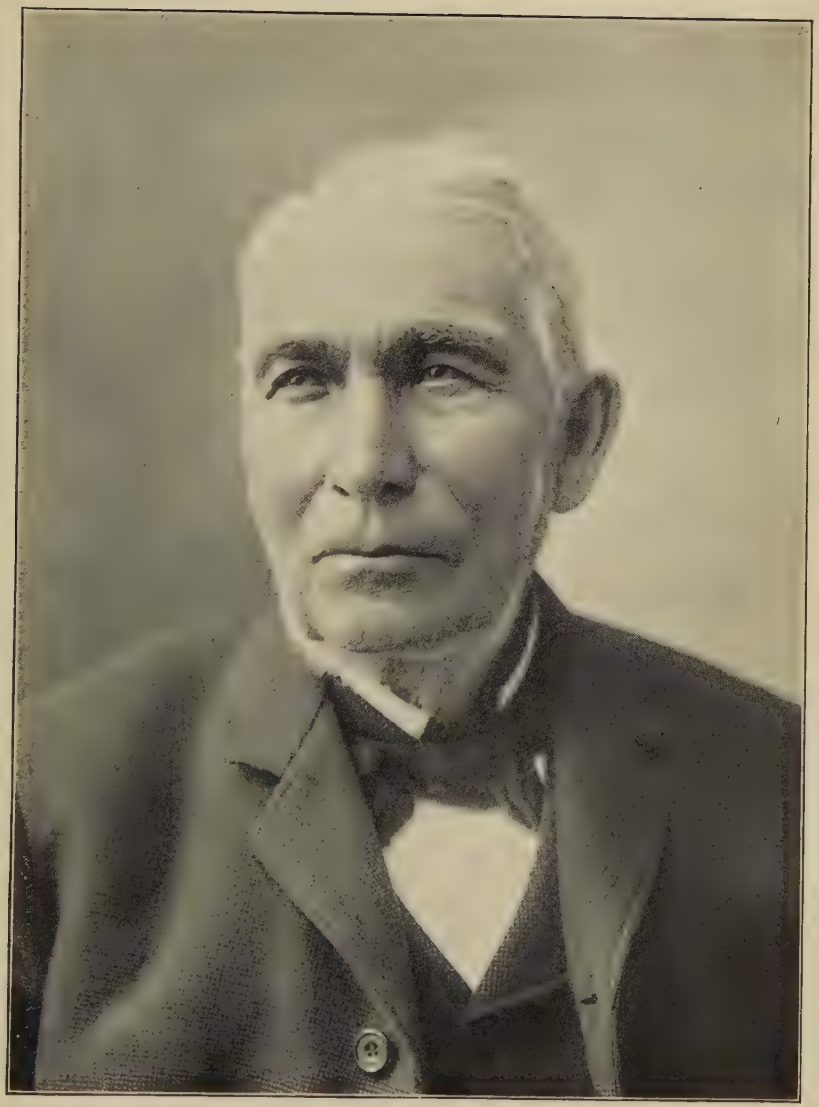
Hauling to the landings, even today, is a difficult matter. The landings are usually not less than a mile from the yards and often the logs have to be hauled a half dozen miles before they reach the landing places. The logs have to be hauled over roads that run over bogs, up hill and down dale, down steep declivities where the load of logs is above the heads of the horses and where the breaking of a rope or chain or a slip of one of the horses might mean death to team and teamster. It is on these steep inclines that the snub-line comes into use and where some of the worst accidents ever recorded in the Maine woods have taken place. The roads over which the logs have to be hauled are kept in as icy a condition as possible at all times. Even though the snowfall be heavy and the snow lies several feet deep on the roads and the surface be smooth as a floor, the lumbermen are not satisfied but must have the surface of the road a glare of ice. Sometimes nature will bring this condition about by a rainstorm which clears with a cold northwest wind that freezes the surface of the roads instantly into a glare of ice. If the rain does not come the lumberman resorts to other means and many of the concerns have sprinklers, such as are used on city streets, and sprinkle the road at night until the surface is of ice. With the roads in this condition a pair of horses will step

along at a lively pace with a dozen or twenty huge logs chained on the sled where the road is fairly level or the grade favorable.

On the pitches, however, no ice is wanted. Everything is done there to retard the progress of the heavy loads as much as possible. The snow is shoveled off, and earth, boughs, manure and other stuff thrown on top of what snow remains so that the heavily loaded sleds will not slip and run on to the horses or put too severe a strain on the snub-line. The curves in the road, if there be any, are banked up as much as possible, to prevent the sled from slewing in going around them and upsetting the load of logs or breaking the chains which hold the logs on the sled.

Here is where the snub-line comes into play. It is a hawser three inches thick and of a length to coincide with the length of the pitch on which it is used. The most common way of using the snub-line is to have a line about twice the length of the pitch. At the top of a steep incline a big tree has been felled, leaving a stump four feet high. The largest tree to be had is always picked for the purpose and the bark is then stripped from the stump from within a foot or so from the top, leaving it smooth as an ax-handle for most of its height.

When the teamster comes to the top of the grade he stops his team and jumps down. He takes the end of the great hawser and passes the line completely around the load of logs, making two half-hitches so that when strain is placed on the line the hitches slip and the noose draws tightly about the load. Then he takes the line and passes it around the stump three or four times, shoving the coil down as near the bottom of the stump as possible, clucks to his horses and takes up the slack, then jumps on the load of logs and starts down hill. The friction of the folds of the big line on the stump is sufficient to hold the load back off the horses, while the weight of the line passing up the hill to the stump is enough to prevent it paying off the stump too fast. The driver stands upright on his load and watches the straining hawser with the eye of a hawk. After a snub-line has been used some time it becomes worn as smooth as glass by the friction of the stump. Sometimes it catches a sharp piece of wood and a few strands are cut. These broken strands untwist as quickly as a coiled spring and when the strain is thrown on the line the break grows larger with amazing rapidity. When one of the big strands breaks the teamster knows it by the convulsive flip of the line and he is on the alert at once. If the line breaks he yells to his horses and sends his whip stinging about their heads. The intelligent brutes instinctively feel their danger when the line snaps and throwing themselves forward into their collars they start on a race with death down the hillside. The driver sticks to his post as long as he can and does his best to guide his steeds. He is comparatively safe, for he can jump any time without much danger into the deep snow.



JOHN MORRISON

BORN IN ANDROSCOGGIN COUNTY, MAINE, IN 1818, HE WAS FOR SIXTY YEARS IDENTIFIED WITH THE TIMBER AND LOGGING INDUSTRY ON PENOBSCOT WATERS. HE DIED AT EAST CORINTH IN 1905
A NOTABLE EXAMPLE OF A NOTABLE GENERATION NOW GONE

Not so with the horses, however. The great load of logs goes swaying after them almost as fast as they could run even though they were not harnessed to the sled. All the frightened animals can do is keep their feet and do their best to keep the load from running on to their heels, or leaving the road, to crash into the trees and take them with it. If one of the horses falls or anything about the sled breaks it is all up with the poor brutes. Sometimes the swaying of the load will break a chain which holds the logs on the sled and let the great sticks go shooting out over the heads of the horses, perhaps catching the teamster unawares also and crushing him to a shapeless mass.

The breaking of a snub-line does not always have a tragic result. It is the miraculous escapes of the men and horses that the men like to tell about afterward. It often happens that the teamster guides his flying steeds and their swaying load down over the steep hill and brings them to a stop after a mad rush of a quarter of a mile, covered with lather and with the sides heaving and nostrils distended, but victors in the race with death.

In the above method of using the snub-line one end of the line passes back up the hill while the end attached to the load is going down. By this method one end of the line is always at the top of the hill and the teams are saved the trouble of carrying the line back up the hill. This method is practicable on most hills, but there are places in the woods where the grade is so long and steep that another method has to be adopted. This other method, while seeming safer, is, as a matter of fact, fraught with more danger to men and horses than the first. The big line is made fast about the load as it was in the first instance and two or three turns are taken around the stump. The rest of the line is coiled up a few yards away. The teamster starts his horses down the hill and two men take the slack end of the line and pay it out gradually as the load descends, always keeping the line taut and running around the stump as smoothly as possible. These men wear mittens with thick leather palms so they can grip the line without having their hands torn and blistered by the line passing through them. If the line gets the better of them they have a way of checking it by using a lever to throw the line harder against the stump, increasing the friction and checking the load.

Sometimes the snub-line gets the better of the men handling it and instead of paying out smoothly goes by jerks, getting from four inches to a foot of slack at every jerk. When this happens there is trouble in store for somebody unless the men can stop the line with their lever. Every slip of the line sends a thrill through the whole length and sets it to swaying and vibrating just as the violin string vibrates when the bow is drawn across it. This makes a great strain on the line and if there is the slightest imperfection in it it is likely to snap, or, in its gyrations, it may get the

better of the men and run through their hands so fast that the leather palms of their mittens smoke and they have to drop it to save themselves. They send a shout of warning down to the teamsters and another race ensues, with Life and Death tossing a coin to see which wins.

There are times when it is not necessary to use a snub-line at all, yet the sled is kept from running on to the horses. This is by using a log chain to trig the runners of the sled. The heavy log chain is wound around the sled runners so that as soon as the load starts the chain is drawn under the iron shoes of the runners, cutting into the road so that it impedes the progress of the sled. Many teamsters consider the log chain the best thing to be used under most circumstances, but the use of the chains make havoc with the roads. Then again there is the possibility of there being a flaw in the chain which breaks when it cuts into the ground and strikes a rock, jeopardizing the lives of men and horses.

There are many places in the Maine woods where the logs cannot be hauled at all, but have to be rolled down the incline. In some places great chutes are constructed of logs and the logs are sluiced down to the landing place below. A notable example of this is to be found not a great many miles from Bangor. Up on Squaw Mountain, about six miles from Greenville, the Shaw Lumber Company has maintained a log sluice nearly a mile in length and sluiced thousands of feet of logs down the mountain and into Moosehead Lake. On Mount Katahdin in the winter of 1905-6 John Ross & Son rolled logs down the side of the mountain, yarding them on the low land. It was a thrilling sight to see these great sticks go tumbling and rolling for hundreds of feet down the mountain side and stopping in the yard below. Lumbering is an interesting and picturesque operation in any of its phases, but there is probably more of picturesque interest in those above chronicled than in any other, unless it be the thrilling and dangerous work of driving and jam breaking.

The woodsman of today is a very different person from the man who swung the ax forty years ago. Formerly, the crews were made up mostly of natives and many of the men were married and belonged to the steady-going class of workingmen; now it is impossible to get enough of that class to go into the woods, and the camps are filled with all sorts and conditions of men—French Canadians, Provincials, lately-landed immigrants and men picked up by employment agents in the large cities. Wages have fluctuated greatly since the Civil War, but in 1904 were as high, or nearly as high, as ever, swampers getting from $18 to $22 a month, choppers, teamsters and sled tenders from $24 to $32, cooks from $40 to $50 and head men from $50 to $65. Wages during the winter of 1905-6 were from $22 to $26 a month for swampers and choppers, and from $28 to $36 for sled tenders, teamsters and cooks.

The woodsman's bill of fare has been greatly varied and improved, and it is no longer true that in the woods the men have to "eat beans twenty-one times a week," for now they have fresh meats, vegetables, dried fruits and other things to tempt appetites that need no coaxing.

When the snow banks of northern Maine are wasting under the high spring sun and the log harvest is over, when the roads have become soft and slumpy and the teams can drag no more loads from the yards to the landings, their axes thrown aside, the picturesque woodsmen of Maine parade the streets of Bangor or other logging centers, clad in strange garb and jingling in their pockets the rewards of a long winter of the hardest kind of work. Their coming to town gives a strong impetus to business and general gayety. The men who hire out in the fall to chop logs, swamp roads or load sleds in the woods need to have strength, first-class appetites and a happy disregard of numerous inconveniences in their manner of living.

It requires about 6,000 men to harvest the Penobscot River log crop, which amounts to about 225,000,000 feet annually, and fully one-half of this army of axmen go to Bangor in the spring time to get their pay and have "a good time." Many of them, after months of enforced sobriety, far from any settlement, seem to feel in duty bound, when they reach Bangor, to have a big spree. This annual "blowout" of the loggers is not so general or so violent as formerly, the crews appearing to grow "tamer" every year, as the police say; but while their money lasts they make Exchange Street lively enough in any year, and it is the harvest time for the saloon keepers, the boarding house keepers and the dealers in ready-made clothing.

Every day the trains from the North bring down scores and hundreds of woodsmen, and the railroad stations are thronged with boarding house runners and drummers for clothing stores, and also by "bummers," who see in the return of the loggers bright prospects for unlimited liquid refreshments. It is an affectionate welcome that this latter class extends to the woodsmen. The latter are assured that they are looking well, and that they are the best men that ever went up the West Branch. The first thing the returning woodsman wants is a drink, and when he drinks everybody in the house is counted in. The saloon keeper, knowing this, sees to it that there are a good many in the house.

The clothing store man generally gets the logger's ear before he has been long in town, and the result is that the logger is fitted out with a new rig that costs plenty even if it doesn't fit him any too well. Then the boarding-house keeper has his turn, and, as he sells both victuals and drink, he usually gets the lion's share of the money.

For a few weeks the saloons do a thriving business and the boarding

houses resound with the songs of the woodsmen—"John Ross," a stirring lyric descriptive of experiences at Chesuncook Lake, and other ballads filled with the praises of woods heroes, all sung to rollicking airs and with an energy that disturbs sleepers in the next block. There is one song, "The Island Boys," which is dear to the hearts of the natives of Prince Edward Island, and this has been parodied by a Bangor balladist. When a native logger desires to have fun with the "P. E. I's," as the islanders are called, he will tune up with the exasperating parody of their pet song, beginning:

> Oh, the boys of the Island they are discontent,
> For it's hard times at home and they can't make a cent,
> So says Rory to Angus, "Here we're doing no good—
> Let's go over to Bangor and work in the wood."

The term "P. E. I's" is applied generally to all men from the Maritime Provinces. They are big, strapping fellows, very good-natured, but they have always been held in contempt by the native loggers because they have been the means of lowering the rate of wages on the Penobscot River. Lately, these Provincials have come to be known as the "Rories" or the "Anguses," because so many of them bear those names. They are mostly of Scotch extraction, and are largely MacDonalds, MacDougalls, MacIntyres, MacPhersons, Camerons, MacPhees, MacBeths and MacIlroys.

It makes little difference with the average logger what the rate of wages may be. He will go in practically destitute in the fall, so that, in order to fit out comfortably for his work he has to patronize the "wangan"—a sort of supply store kept in every woods camp. The wangan is generally run by the operator, or proprietor of the camp, and the prices he charges for his goods—stockings, mittens, woolen shirts and sweaters, moccasins, gum boots, tobacco, playing cards, etc., are sometimes little short of plain robbery. The logger has no money in the woods, it is all a credit transaction, and, when he comes to settle in the spring, the list of charges against him is surprisingly long. Whatever may be left of his wages, after settling the wangan bill, the logger squanders in Bangor. He has a grand celebration lasting a week or two, and then, completely bankrupt, he gets a job on the log drives, where the season is shorter, the wages higher and the work more dangerous than in the woods. Going on the drive is more dangerous than going into most wars. The rivers of Maine are lined with the graves of drowned drivers, one locality on the West Branch of the Penobscot, known as "the boneyard," containing more than forty little mounds where wooden crosses mark the resting places of men who lost their lives in "quick water."

LOG DRIVING.

The methods of log driving have been greatly improved from time to

time. Besides the logs driven by individuals and firms, employing from ten to 300 men each, a large amount of driving is controlled by log-driving companies, which are making every effort better to adapt the water courses to the easy movement of the logs. Dams have been so placed as to control, to an extent, the supply of water, and various obstructions have been removed from the beds of the rivers and streams. As the logs of individual operators are driven out of small streams into the main rivers or their larger branches, they become intermingled with the logs of other drives from neighboring streams, so that it is impossible for each individual operator to make a separate drive to the boom. For this reason log-driving companies are formed to take charge of all the logs which come into the waters which they control. Often several drives are made on the same river during the spring and early summer in order to care promptly for both the early and late logs—for there is a great difference in the times when the individual drives are turned into the main streams or rivers. When the logs are all driven into the main boom the expenses incurred by the log-driving companies are figured up and each owner whose logs are included in the "corporation" drive is assessed in proportion to the quantity of logs he owns.

The respective logs of various owners are distinguished from others by private marks; and the marking of the logs, which is done when they arrive at the "landings," is one of the most interesting operations of lumbering. The marks must be indelible, else they would be effaced by the long and rough passage through hundreds of miles of rock-lined streams, and in all the eighty years of lumbering in Maine no one has been able to devise a better method of marking than with a sharp ax in the hands of a skillful woodsman. The marker is an artist in his way and he seldom or never makes a slip or an error. There are a head marker and several assistants and they stand upon the log piles swinging their axes with as much ease and as great precision as a shipping clerk marking boxes with a brush. The hieroglyphics inscribed upon the logs are numerous and of wonderful variety. There can be no two alike, and they must be distinctly cut, else would ensue a hopeless mixup at the boom. To the uninitiated these symbols are past understanding, but to the logger of experience they are as plain to read as the alphabet—every log owner immediately knows his own.

Some of the symbols are very simple, and these are the older ones; some are complicated, for, with the increase in the number of operators and owners, the primitive marks have all long since been appropriated and new comers have been obliged to invent new and distinctive marks. There are crosses, the X and double X, daggers, crows' feet, letters combined with notches, chains, girdles, belts and fishtails, and numerous

combinations of these signs. One of the most famous marks of the Penobscot in the old days was that of Palmer & Johnson—"V Y V"—and these letters were for years carried also on the house flags of vessels owned by that firm.

While any strong, healthy man can do some kind of work in the woods, it is not every man, nor one in ten, who is fit to be a log driver. He must be young, quick on his feet, courageous and able to stand hardships incident to the navigation, in cold and rainy weather, of a great mass of logs through many miles of swift, rough water. He gets more pay than the woodsman and deserves it. Good men used to get as high as $3 or $3.50 a day, but from $2.50 to $2.75 is the maximum now and ordinary drivers get only $1.75 or $2. The drives occupy periods ranging from thirty to ninety days, according to the quantity of logs, the pitch of water and the distance to be driven. In Maine the longest drive, as well as the largest, is that on the West Branch of the Penobscot, where from 80,000,000 to 100,000,000 feet of logs are handled every year. The best drivers come from Bangor and along the Penobscot, and these men are often employed to drive the Androscoggin, Kennebec and Connecticut.

After the drives come in many of the crew go to work in the sawmills, or go back to the woods, there being little occasion for idleness as lumbering is now managed. As a rule, however, the sawmill crews are made up early in the season, and wages are so high now that many of the men engage in no other work, loafing through the winter rather than going into the woods. Once sawmill men worked from dawn to dark—often thirteen hours—but now the working day is ten hours and wages are better than ever before.

To write the history of the lumber industry of any region is a difficult matter, involving much research, much compilation of figures and assembling of facts; yet the man who writes plain prosaic history has a comparatively easy task compared with that of him who would attempt to picture in words the picturesque romance of the lumber camps and mills. The forest itself is in the highest degree poetic. It may be this that causes its conversion to commercial uses to be accompanied through each stage by quaint and unusual circumstances. Life in the forest is itself the antithesis of life in the city. In town people come into contact chiefly with each other and with man-made institutions, but the toiler in the forest is akin in freedom to the beasts and birds that inhabit it. He feels an independence and a self-dependence he would not experience in a crowded town. He is very near to nature. For that reason the physical appeals to him more than the mental and the natural result is the production of men mighty in form and spirit. The element of danger which accompanies all woods work also serves to strengthen the character of the

woodsman. The loose limb, the much feared "widow maker," hangs suspended over him like the sword of Damocles.

The lumber industry of America has witnessed the death of thousands of unnamed and unknown victims of the lurking dangers of the forest, many of whom met their end in a heroic way. When the log has reached the river the dangers that surround the woods worker are increased, and no other State has witnessed as many stirring adventures as has this pioneer Commonwealth. The fall of most of the Maine rivers is rapid, their beds are often rocky and there are hidden dangers in almost every mile. On the Penobscot, for instance, between the stone dam and Shad Pond, there is a stretch of rough water which has claimed the lives of many brave men. The same conditions apply to nearly all the log driven streams of the State.

There is romance even in the sawmill, for the element of danger accompanies the log up the logdeck and past the waiting saws and out of the mill again. Nor does it end there, for there is certainly much that is picturesque and heroic in the lives of those rude sailors who, for from $25 to $30 a month, take their lives in their hands and go out upon the Atlantic, often in rickety barks, on their way to distant markets. It would be well if those who sit well housed by the lumber of Maine, or of any other state, occasionally would give a sympathetic thought to the men of the woods who, inspired by no greater purpose than to make a living, but at the risk of life and health, have brought the tree to the mill and the lumber to market and made possible the comfort of many millions.

The young man of Maine desiring instruction in theoretical as well as practical forestry does not need to leave the State in search of it, for there is a course in forestry at the University of Maine, at Orono. It extends over four years, in the first two years of which the student is expected to acquire a good knowledge of higher mathematics, botany, biology, plant physiology, general and laboratory chemistry, English and English composition, physics and surveying. The last two years are devoted to practical work in the field.

CHAPTER IV.

MAINE—THE PENOBSCOT DISTRICT.

About thirty percent of Maine's log crop is cut on the Penobscot River, which has always been the chief center of the industry in Maine and famed on both sides of the Atlantic for its exports of spruce and pine, as well as of white birch and, in former times, of hemlock and cedar. Bangor, situated at the head of tide water, twenty miles from Penobscot Bay, is the shipping point not only for the entire valley of the Penobscot, but for mills located along the lines of the railroads far north in upper Penobscot, Piscataquis and Aroostook counties. Bangor is one of the most remarkable of river ports, the river in front of the city having such breadth and depth that hundreds of vessels, ranging in size from the little bay coaster to the full-rigged ship, are easily accommodated, including the immense modern schooner of four or five masts and the ocean-going steamer. Vessels come to Bangor with cargoes of coal up to 4,000 tons, drawing twenty-four to twenty-six feet of water, and leave with cargoes of lumber up to 2,000,000 feet—occasionally more. With a fair wind vessels of 500 tons and under may safely come up under sail; but, as a rule, all except the smaller coasters are towed from Fort Point Cove, twenty-two miles below the city front.

Bangor, settled in 1769 and incorporated in 1791, is a city built up by the lumber trade, and, until recently, lumber was almost the sole support of the place. In the early part of the Nineteenth Century the city thrived on the pine trade, having an extensive commerce with the West Indies and Europe, and large fortunes were made in it. The *North American Review* said in 1844:

"Among the several ports for receiving and shipping lumber, Bangor is to be regarded, we think, as the most considerable in the Union. Well-informed persons of that city estimate the amount which passed through the hands of its merchants in 1843 at $2,000,000. With a deference to their opinion, we must still doubt whether it was so much by a quarter of a million; or, if it were, whether $1,500,000 be not the maximum on an average of years."

When the pine became scarce spruce was taken up, and at one time a large and profitable trade in deals was carried on with the United Kingdom, the continent of Europe and various ports of the east coast of South America. The deal trade had its greatest prosperity in the years imme-

diately following the Civil War, then declined under the competition of the Maritime Provinces of Canada, enjoyed a brief revival a few years ago and again relapsed, nothing of that character of any account now being done. Today the great bulk of the lumber sawed on the Penobscot is shipped in vessels from Bangor to Boston, New York and ports along the New England Coast, and from Portsmouth, New Hampshire, to New York. The vessels in this trade are for the most part two-masted schooners carrying from 100,000 to 200,000 feet, with a few of greater capacity. Freight rates generally range from $1.75 to $2 a thousand feet to Boston and ports east of Cape Cod, $2.25 to Long Island Sound and $2.50 to New York, with an advance of twenty-five to seventy-five cents a thousand late in the fall, when a vessel usually carries rather less than in summer and when the risks are greater. Formerly, considerable long timber and joists were shipped to Philadelphia and a great quantity of lath to that port and Baltimore, but of late this trade has practically disappeared, the supply of the ports named being obtained from West Virginia and regions farther south.

In former times nearly all of the lumber sawed at the mills above Bangor was brought down to the docks of the city in long rafts and afterward overhauled and sorted, the various kinds and dimensions being made up into smaller rafts and thus floated to the vessels in the harbor. Today only one mill, that of James Walker & Co., at Orono, sends its product to Bangor in rafts, nearly the entire output of the upriver manufacturers being transported by rail to Bangor, while much of it goes through, without rehandling, to Boston and other markets. Still, the bulk of the lumber manufactured on the river, as well as much of the product of the mills at Ashland and other Aroostook County points, is shipped from Bangor in vessels, and it will be a long time before the railroads will be able to make a freight rate sufficiently low to take the business entirely away from the coasters, if such a condition should ever be reached, which does not seem likely.

In spite of the later preëminence of Bangor, the first Maine port to be utilized for the exportation of ship timber was Castine, Hancock County, one of the first places settled in Maine. It is situated on the peninsula of Marche-Biguatus (commonly called Bigaduce), on the eastern side of the Penobscot, seven miles from the mouth of the Penobscot River. Under the name of Pentagoet that peninsula became known to the first settlers in New England, and as early as 1630 was selected by the Plymouth Company for a trading station. During the Revolution the English government wished to establish a military post there for the purpose of checking the ravages of privateers and also securing a supply of timber for the Royal navy. Massachusetts sent the largest American force that had

ever been fitted out, consisting of forty-three vessels carrying 2,000 men and 340 mounted guns, but the expedition failed owing to the incapacity or cowardice of Saltonstall, the commander of the naval forces, who afterward was discharged for so disgraceful a defeat. No place in Maine has passed through so many changes as this ancient town. It has been possessed successively by the Indians, French, Dutch, English and Americans. No fewer than five naval engagements have taken place on the bosom of its harbor. After the Revolution terminated, Castine became rapidly settled.[1]

EARLY SAWMILLS.

The erection of sawmills and manufacture of lumber appear to have begun in Maine as early as the Seventeenth Century. At that time the present states of New Hampshire and Maine were a part of Massachusetts, and Mason, Gorges and the Pepperells, the original heavy land proprietors in New Hampshire and Maine, engaged extensively in the business.

When LaTour attempted the capture of Penobscot in 1643, D'Aulney's force took refuge in a mill, from which they were driven and the structure set afire.[2] The presence of a mill at that early date is thus attested.

In 1760 Francis Cogswell, of Ipswich, built at Vinal Haven a double sawmill, which he sold in 1776 to Thaddeus Carver. A few years afterward it was destroyed or fell down. Job Calderwood erected a sawmill near the carrying place about 1775, and afterward a grist mill. Other mills built at Vinal Haven prior to 1800 included a grist mill built at Pulpit Harbor Stream by Thomas Beveridge, a grist mill at Arey's Harbor, occupied by Ben Coombs, a sawmill near the head of Crockett's River, built by Ben and Sylvanus Coombs, and mills at Mill Creek and Vinal Haven Falls, built by William Vinal, Senior.[2]

It is a matter of record that as early as August 8, 1762, Colonel Jonathan Buck, of Haverhill, Massachusetts, located at the present site of Bucksport, Hancock County, on the Penobscot, and built a sawmill on Mill River, a small stream passing through the present village.[1] W. D. Williamson's "History of Maine," published in 1832, puts the date somewhat later and says, on page 554, Volume II: "Bucksport was incorporated June 27 [1792]. The first settlement was commenced in 1764, where the village now is, by Colonel Jonathan Buck . . . and his associates, who removed there with their families and built a sawmill and two dwelling houses the same year."

Another early sawmill point of the Penobscot region was Camden, originally called Megunticook, on the west shore of Penobscot Bay, incorporated February 17, 1791, and so named in memory of Lord Camden,

[1] "History and Description of New England," Coolidge and Mansfield, 1859.
[2] *Bangor Historical Magazine*, Vol. VI, 1891.

a parliamentary friend of the colonies in the Revolution. That township, which was a part of the Waldo patent, was surveyed by David Fales, of Thomaston, in 1768, and within three or four years thereafter settlements were begun on Goose River, Clam Cove and at Megunticook. Mills were erected and some farming was attempted. The sawmill on Megunticook Stream was burned by the British during the Revolution, and they set fire also to the grist mill. By 1794 Camden had again become a flourishing town.[3]

Daniel Osgood, one of the first settlers of Blue Hill, built a grist mill on Mill Brook. Tide mills were erected in 1765. In 1768 a grist mill was built at the outlet of the pond near the falls, at the raising of which every person living in the town was present. The mill was named the "Endeavor." It is recorded that, on March 5, 1770, the town voted to keep open the fish course at the "Mill Endeavor." Prior to 1772 Carlton built a mill, afterward known as Allen's mill. March 28, 1774, the town voted to clear the fish course through Sitcomb's dam.[4] In the early settlement of the town, Blue Hill—the majestic hill near the center of the town, rising to an altitude of 950 feet above high water mark—was covered with trees, principally evergreen, which at a distance gave it a very dark blue tint, hence its name. It is now entirely bald.[5]

Bangor originally was known as Kenduskeag Plantation. The first attempt at settlement was made by Stephen Buccell, who, with his family, spent the winter of 1769-70 there. During the ensuing spring and summer he was joined by a few others.[5]

History tells us that a sawmill on the Penobscot was built at Bangor in 1771, and much of its product was sent to Castine, on Penobscot Bay, which was then an important port much resorted to by ships of King George's navy. Other mills followed in rapid succession and the erection of each, like the raising of a barn in the good old days, was made the occasions of a general celebration with "liquid features." Of the erection of one of these Eighteenth Century mills, history states: "They got the mill up the first of the winter and used two puncheons and one barrel of New England rum and had not enough liquor to finish the raising and completing of the mill."

In 1772 the Bangor settlement contained twelve families, but an act of incorporation was not obtained until February 25, 1791, at which time the settlement contained a population of 576 inhabitants. Rev. Seth Noble, as the representative of the town, was entrusted with the duty of obtaining its incorporation. He was directed by the inhabitants to have the town called Sunbury—a name which was deemed appropriate on

[3] "History of Maine," W. D. Williamson, 1832.
[4] *Bangor Historical Magazine*, Vol. VI, 1891.
[5] "History and Description of New England," Coolidge and Mansfield, 1859.

account of its pleasant situation—and to see that that was inserted in the act. Mr. Noble, however, had a great partiality for the old psalm tune "Bangor," and when the speaker called for the name of the town, recollecting, probably, this tune better than the instructions of his townsmen, Mr. Noble answered, "Bangor," and so it was named.[6]

Joseph Potts built a sawmill on the Kenduskeag, at Bangor, soon after his arrival at that place during the Revolutionary War. It was the first sawmill built on the Kenduskeag.[7]

Nathaniel Kent, of Boston, built a mill about 1778 at Deer Isle, and about contemporaneously Mark Haskell & Sons built a saw and grist mill at Northwest Harbor. The earliest record of the sale of a mill to be found is of one at Penobscot, now Brooksville, when Colonel Gabriel Johonnot bought half of the Holbrook mills, at Goose Falls, May 10, 1788, for £210. Mills were built on Stinson's Neck, at Emerson's Pond, in 1790, and a man named Crockett had a mill in that locality at that time. David Thurlow built a mill on Thurlow's Island about 1800.[8]

Josiah Hills, of Newburyport, Massachusetts, moved his family to Brownville, Piscataquis County, in 1806 and built a mill on the Ebeme [?] River. A part of the wooden dam then built was still in existence in 1859.[6]

LATER DEVELOPMENT OF THE INDUSTRY.

The industry did not attain any considerable success, however, until well along in the Nineteenth Century, wars and rumors of wars and the lack of capital retarding its growth; and the earliest record that gives any definite information states that in 1816—"the year without a summer"—there was manufactured at Bangor about 1,000,000 feet of lumber. The business increased slowly until 1822, when settlers from Massachusetts began to pour into the Penobscot Valley and the lumbering interests made rapid advance—so rapid that in 1831 the output of the Penobscot mills had increased to 30,000,000 feet. In 1832 the first railroad in Maine, and among the earliest in the United States, was built by Gen. Samuel Veazie to haul timber from the Oldtown mills to Bangor. The rails were of wood, strapped with iron, and the locomotive was built in England by Stephenson.

As late as 1832 there was merchantable pine standing on the Penobscot River within the present limits of the city of Bangor.

Up to that date no improvements on the river had been begun and the large cut of logs suggested to the lumbermen the necessity of a boom and piers among the many islands to securely hold the logs. Consequently, a charter for a boom was obtained, and enough of it was built safely to hold the log cut. Many large blocks of sawmills were begun, mostly

[6] "History and Description of New England," Coolidge and Mansfield, 1859.
[7] *Maine Historical Magazine*, Vol. VIII, 1894.
[8] *Bangor Historical Magazine*, Vol. VI, 1891.

located at and near Oldtown, twelve miles above Bangor, on the Penobscot. These blocks contained only single saws, and often during the sawing season great effort was made to see who could do the largest day's work. Seldom did a crew saw over 6,000 feet in a day.

All side boards were edged on the log and most of the slabs and edgings were thrown into the river, which in seasons of drouth accumulated on rocks, falls and sand bars, turning the water into a narrow channel, thereby aiding the running of rafts to Bangor.

In 1832 the following act, regulating the survey of lumber for Penobscot County, was passed:

Pine boards shall be of four sorts:
No. 1 shall include boards not less than inch thick, straight grained, free from rot, sap, knots and shakes.
No. 2 includes boards not less than inch thick and free from large knots and suitable for planing.
No. 3 not less than $\frac{7}{8}$ inch thick, free from rot and nearly square edged, and suitable for covering boards.
No. 4 shall include all boards and plank of every description not before mentioned.

Spruce, hemlock and juniper were of two sorts. No. 1 included all boards, plank and joist, sound and square edge, and No. 2 all other descriptions.

The price of pine, up to 1842, was, for No. 1, $20; No. 2, $13; No. 3, $8. Prices in 1864, No. 1, $60; No. 2, $50; No. 3, $40. These were the highest prices in the history of the lumber industry on the river, and were due not only to the market but to the depreciated currency of the time.

The regulation survey was often amended and now but little attention is paid to it either by the seller or purchaser.

Hemlock logs sold in 1848 for $2, and in 1890 for $7. Hemlock boards sold in 1848 for $6, and in 1890 for $10.50. Spruce logs sold in 1838 for $3, and in 1889 and 1890 for $11 to $13.

IMPROVED METHODS.

Gang saws came into use about 1850. That year saw great improvement. Lumber was manufactured better, more rapidly, and at less expense. The crews working these gangs did a big day's work every season, and often 40,000 feet was turned out in a day.

The first circular saw ever started in Maine was taken there by George Page, of Baltimore, and put into the water power mill of John Webster, on the Kenduskeag Stream. The saw was forty-eight inches in diameter and was made by Gage, Hubbard & Co. After a thorough trial the mill was pronounced a failure. It required nearly a half inch for the saw kerf and no one had then thought of a saw swage to spread the cutting points of the teeth. The permanent introduction of rotary saws came in about

1860, although only a few were in use for years thereafter. These rotary crews, too, had their day of big sawing and in 1889 there was recorded, as one day's work, 132,917 feet.

Band saws were used for the first time in 1889. Two were built that year. One was driven by steam and the other by water. Both gave the owners great satisfaction. Great interest was manifested by all manufacturers in the working of these machines, and the owners claimed better results from their use than could be obtained from any other saw. The big day's work must be done before the close of the sawing season, so the day's effort with steam power figured 128,357 feet of spruce lumber.

The edging law was enacted in 1868, and caused great dissatisfaction at first, but, as practiced, soon became acceptable. The following is an extract from that law, approved February 5, 1868, to take effect December 1, of the same year:

"No person or persons shall cast or throw into the Penobscot River, below the mouth of the Mattawamkeag River, or into any of its tributaries, entering below the mouth of said Mattawamkeag River, any slabs, board, or lath edgings, bark or grindings of edgings, wood or timber of any sort. Penalty not less than $5 nor more than $20, if the quantity shall not exceed five cords."

The lumber trade of the port of Bangor up to 1890 may be summarized as follows:

Prior to 1832 (estimated)	200,000,000 feet.
From 1832 to 1855 (surveyed)	2,969,847,201 feet.
From 1855 to 1890 (surveyed)	5,902,755,919 feet.
Total	9,072,603,120 feet.

The early mills sawed pine almost exclusively, that timber abounding along the river in the immediate vicinity of Bangor. When this nearby supply had been cut off, operations were extended to the various branches of the river—the Mattawamkeag, Baskahegan, Passadumkeag and Piscataquis—and later to the East Branch and the West Branch of the Penobscot. No spruce was cut until 1845; and it was not until 1851 that the cut of that timber amounted to 50,000,000 feet. The first spruce was cut on the Mattawamkeag in 1845, and in 1850 small operations were conducted on the East Branch. The men who went into the spruce business were considered little better than crazy, for that kind of lumber was despised in the good old piny days and few had any use for it.

The Penobscot Boom Company was chartered in 1832 and a systematic handling of logs was begun, the booms being located just above Oldtown, thirteen miles from Bangor. The Penobscot Log Driving Company was chartered in 1846 for driving the West Branch. It is said that the first operators to cut any spruce on that branch were Moses and Joshua Buck. The West Branch is very rough water, when at good driving

ARQUILLE BOOM, PENOBSCOT RIVER, NEAR BANGOR, MAINE

pitch, and the drivers of those days were rather afraid of it—so much so that the men who brought the first logs over Ripogenus Falls wore life preservers.

It is estimated that prior to 1832 there was cut on the Penobscot 200,000,000 feet of logs; in the period from 1832 to 1855 the output was 2,978,603,149 feet, while in the fifty-one subsequent years, inclusive of the business of 1906, 8,355,326,309 feet of lumber has been sawed at the river mills and shipped, chiefly by vessels, from Bangor, only a very small fraction of the product going into local consumption. This makes a total of about 11,533,929,458 feet of lumber taken from the Penobscot forests since the inception of the industry that has carried Bangor's fame abroad and piled up wealth at home.

As has been said, in the early days of Penobscot lumbering, as in other parts of the State, pine was cut almost exclusively, spruce attracting no attention until about the middle of the Nineteenth Century. The pine was sawed mostly into boards and shipped to the West Indies, where it was exchanged for Spanish gold, molasses and rum; and, while this traffic lasted, Bangor's foreign trade was lively. A large fleet of the old-fashioned brigs and topsail schooners found employment in a trade that paid high freights; hundreds of cargoes of the great, clear white pine boards went out to Cuba, Porto Rico and Martinique, and other cargoes of the products of the Antilles came back. Lumber shippers, timber land owners, lumber operators, shipbuilders, shipbrokers and others grew wealthy, and there were high wages and flush times generally for everyone connected with the business, from the man who swung the ax in the woods to the merchant prince of Bangor, with his mills turning out piles of pine boards, his store smelling strongly of rum and molasses and his vessels carrying his family name and private log mark to distant seas.

From the profits of this trade were built the rows of old-fashioned brick buildings yet standing in Bangor and scores of the quaint old mansions that border the best residence streets; and from this trade were accumulated the fortunes that, invested in spruce lands, bank stocks and other securities, were the foundation of Bangor's present wealth. What the lumberman of 1840 won as a pine king enables his grandson of this day to be a spruce king, or a man of importance in some other operation.

Up to the beginning of the Civil War, pine was the mainstay of the industry on the Penobscot, spruce being of secondary importance; but the decadence of the pine and the ascendency of the spruce had begun—the decline of the West India commerce and the beginning of a new era in the lumber trade. In 1855 123,000,000 feet of pine was surveyed at Bangor and only 78,000,000 of spruce, but the ratio rapidly changed and in 1861, for the first time, spruce took the lead, with a survey of 72,000,000

to 48,000,000 of pine. Spruce has been king on the Penobscot ever since then, while pine has steadily declined until now it is a very small factor in the industry on the river, or, for that matter, in any other section of Maine. Only 12 to 15 percent of the annual cut of logs on the Penobscot in these days is pine, and most of that is of second growth. There are many big pine trees yet standing in Maine, but they are far away to the north, where it would be expensive to get at them and bring them to market. The 20,000,000 or 25,000,000, feet of pine now cut is sawed chiefly into box boards, which are shipped by rail direct from the mills to Massachusetts. A few cargoes of boards of the grade known as "shippers" are sent to the West Indies every year, and a few thousand feet of clear pine, for the building of dories (boats used by fishermen), are sent to St. Pierre, Miquelon. When, as happens occasionally, a big pine tree is cut in any but the far northern part of Maine the papers have paragraphs about it, telling of its dimensions and regretfully recalling the days when such trees were plentiful.

PRODIGAL MISUSE OF PINE.

The "sinful waste" of the big pine is made the subject of many a mournful reminiscence nowadays, and old timers talk by the hour of how this wealth was scattered. As much pine was wasted in the flush days as is cut now, and the slabs that were thrown away were as thick as deal planks. When a crew of stevedores got down to the muddy bottom of a raft they would set it adrift sooner than handle it or take the trouble of washing it. The river at Bangor was full of drift, and any boy with a punt (a flat, square-ended boat) could pick up enough pine boards and timber in the course of a summer to build a good-sized cottage—fine, clear pine that would bring a high price today. Such vast quantities of heavy pine slabs were thrown into the river that, in the course of years, the channel became so shoal that the United States government was called upon by the shipping interests to remove the deposits, and dredging operations were carried on for several seasons at great expense. Slabs twenty to thirty feet long and three to five inches thick were taken out by thousands of cords and dumped in shoal coves along the river, filling up wide areas now covered with railroad tracks. The extent of these waste deposits in the river may be realized from the fact that there is now a sufficient depth at low tide for ordinary-sized coasters where formerly a boy could wade out for a distance of 100 yards.

THE DEAL TRADE.

The Civil War, at its inception, had a demoralizing effect upon the lumber trade of the Penobscot, as is shown by the fact that the survey at Bangor fell from 201,000,000 feet in 1860, to 131,000,000 in 1861; but the depression was only temporary, for in the succeeding years, 1862-3-4,

the figures were 160,000,000, 190,000,000 and 174,000,000, respectively; while in 1866, after the close of the great struggle, business revived with a jump, the enormous quantity of 237,547,606 feet of lumber being surveyed at Bangor in that year, 154,971,243 feet of this spruce. It was at this time that the deal trade, which marked another epoch in the Penobscot lumber industry, began, and for six or seven years there was a bustle along the river recalling the palmy days of the big pine. In that period, in fact, the lumber survey ran higher than at any time before or since, averaging for the seven years 1866 to 1872, inclusive, about 218,000,000 feet.

The deal trade brought to Bangor a larger class of vessels than had ever before come to the port, including many of the finest American wooden ships, such as the *Belle of Bath, William H. Connor, Phineas Pendleton, Caledonia, Conqueror, N. T. Hill, Martha Cobb* and *Paul R. Hazeltine.* These big fellows loaded at Highhead docks, where there is a depth of water equal to that found at most of the prominent Atlantic Coast ports, and a great many stevedores were employed filling their capacious holds with four-inch spruce planks destined for Liverpool, Glasgow, Bristol, Drogheda and Rotterdam. From 20,000,000 to 40,000,000 feet was shipped annually to Europe, besides large quantities of two-inch and three-inch stuff to the River Platte, South America.

When the Maritime Provinces began to compete for the European deal trade and prices fell below the profitable point, the Penobscot manufacturers quit the business and turned their attention to the American market, sawing what was known as "New York stuff"—two-inch and three-inch spruce planks—and to this day a good part of Bangor's spruce goes that way. A few years ago there was a revival, to some extent, of the deal trade and several British steamers were loaded at Bangor for ports in the United Kingdom, shipments ranging from 5,000,000 to 15,000,000 feet annually up to 1899. In 1902 the only shipments of deals abroad were two deckloads on spool bar steamers, aggregating about 300,000 feet, the price of logs on the Penobscot being too high to allow of any profit in sawing for the European market. No deals were shipped in 1905; the price of spruce was too high at home.

THE LUMBER STATUS OF BANGOR.

The lumber trade of the Penobscot has experienced many ups and downs since the days when pine was plentiful and the children used to read in their geographies the gratifying statement that Bangor, "located on the right bank of the Penobscot, sixty miles from the sea, is the second city in Maine and the greatest lumber mart in the world." Bangor is still the second city in Maine in size and general importance, but the geographers can no longer say and be within a mile of the truth that it is

"the greatest lumber mart in the world," for it long ago lost that proud distinction. Competition from the Maritime Provinces, the advent of southern pine, iron and steel construction, the depletion of Maine's pine woods, the panic of 1873, various dull periods since then and a general revolution in methods and expansion of the fields of commerce and industry—all have operated to set Bangor back a good many notches. Still, with about 200,000,000 feet of logs cut every year now on the Penobscot, and more than half of this, with about 30,000,000 feet more from other rivers, passing through its port in the form of long lumber, Bangor still may be reckoned among the lumber towns of importance and probably will continue for many years yet to hold a prominent position in the trade. Its past, while to the thoughtful tinged with memories of extravagance, is something glorious, and, statistically, staggering. The resources of the Penobscot forests and the activity of the Penobscot sawmills are eloquently expressed in the reports of the Surveyor General's office. Herewith are the figures showing the amount of lumber surveyed at the port of Bangor—which takes in the whole of Penobscot County—from 1832 to 1906, inclusive. As spruce cut little figure previous to 1851, only the total survey is given up to that year:

LUMBER SURVEYED AT BANGOR, 1832-1906—FEET BOARD MEASURE.

Year.	Pine.	Spruce.	Hemlock, etc.	Total.
1832	.....	.....	.....	37,556,093
1833	.....	.....	.....	44,000,845
1834	.....	.....	.....	30,756,558
1835	.....	.....	.....	67,431,699
1836	.....	.....	.....	50,841,756
1837	.....	.....	.....	61,976,832
1838	.....	.....	.....	74,020,409
1839	.....	.....	.....	90,767,789
1840	.....	.....	.....	70,717,421
1841	.....	.....	.....	82,338,639
1842	.....	.....	.....	112,341,566
1843	.....	.....	.....	120,137,126
1844	.....	.....	.....	116,788,121
1845	.....	.....	.....	154,884,849
1846	.....	.....	.....	140,084,864
1847	.....	.....	.....	191,136,272
1848	.....	.....	.....	213,051,235
1849	.....	.....	.....	160,418,808
1850	.....	.....	.....	203,754,201
1851	143,586,200	47,567,682	10,851,948	202,005,830
1852	124,399,736	63,859,929	11,129,757	199,389,422
1853	92,484,711	78,087,096	12,370,477	182,942,284
1854	93,446,799	53,564,196	12,580,342	159,591,337
1855	123,026,157	78,337,283	10,305,753	211,669,193
1856	102,411,667	66,526,983	11,323,580	180,262,230
1857	75,816,045	56,735,284	12,557,680	145,109,009
1858	69,453,844	62,045,696	16,166,907	147,666,447
1859	84,704,700	78,066,187	15,275,553	178,046,440
1860	98,401,676	88,285,040	14,662,811	201,349,527
1861	48,238,957	72,928,910	9,874,824	131,042,691
1862	61,725,787	90,865,804	7,471,392	160,062,983
1863	63,544,438	110,204,467	16,823,364	190,672,269
1864	54,846,506	106,774,936	12,814,830	174,436,272
1865	48,296,222	107,505,867	14,078,934	169,881,023
1866	63,575,411	154,971,243	19,000,952	237,547,606
1867	51,207,174	139,445,478	15,830,706	206,483,358
1868	50,309,399	152,931,455	17,553,912	220,794,766

LUMBER SURVEYED AT BANGOR, 1832-1906—FEET BOARD MEASURE.—Continued.

Year.	Pine.	Spruce.	Hemlock, etc.	Total.
1869	40,980,911	133,756,757	16,103,240	190,840,908
1870	30,030,000	149,103,192	22,881,000	202,014,192
1871	42,383,000	163,121,675	21,987,000	227,491,675
1872	46,150,000	176,933,649	23,370,000	246,453,649
1873	32,586,848	129,277,908	17,337,592	179,202,348
1874	24,178,309	135,226,015	17,382,608	176,786,932
1875	22,335,849	116,664,487	15,662,793	154,663,129
1876	19,615,572	82,087,987	13,417,632	115,121,191
1877	14,704,152	85,480,149	17,683,444	117,867,745
1878	19,479,497	81,358,056	21,302,775	122,140,328
1879	17,959,415	91,907,627	12,695,220	122,562,262
1880	17,668,651	91,573,149	14,208,737	123,450,537
1881	33,732,101	104,704,537	15,912,159	154,348,797
1882	33,408,035	122,548,230	16,154,829	172,111,094
1883	26,522,485	115,348,484	19,392,223	161,263,192
1884	24,718,767	84,425,303	16,169,276	125,313,346
1885	30,480,937	94,446,522	17,867,104	142,794,563
1886	28,603,783	100,905,443	17,055,420	146,564,466
1887	29,108,725	102,746,234	17,792,578	149,647,537
1888	30,942,687	114,348,153	19,473,695	164,764,535
1889	27,885,394	121,659,086	20,665,903	170,210,383
1890	28,255,236	129,541,485	21,310,006	179,106,727
1891	23,114,771	118,205,741	23,664,844	164,985,356
1892	26,896,302	105,044,377	28,453,079	160,393,758
1893	22,425,974	81,400,612	25,447,931	129,274,517
1894	25,369,893	116,969,664	18,934,467	161,274,024
1895	27,189,050	91,488,448	25,513,996	144,191,494
1896	23,229,739	90,449,002	24,270,204	137,948,945
1897	25,935,354	118,007,612	25,817,117	169,760,083
1898	22,501,025	95,167,159	26,656,559	144,324,743
1899	23,246,498	133,234,823	25,001,268	181,482,589
1900	22,543,902	102,465,989	17,689,361	142,699,252
1901	22,723,741	81,971,594	16,259,562	120,954,897
1902	21,755,767	87,793,649	15,218,230	124,767,646
1903	31,778,278	101,985,724	22,745,196	156,509,198
1904	28,303,861	106,602,644	28,778,965	163 685,470
1905	.....	.....	.....	185,000,000
1906 (estimated)	.....	.....	.....	180,000,000

The figures given in the table above relate to lumber sawed and surveyed within Penobscot County. The annual cut of logs on the river ranges from 225,000,000 to 250,000,000 feet, and in 1905-6 the latter figure was exceeded. Allowing about 90,000,000 to 100,000,000 feet for pulp, there remains from 125,000,000 to 150,000,000 to be sawed. This yields anywhere from 150,000,000 to 180,000,000 feet of lumber, the difference in scales, or overrun, accounting for the seeming discrepancy in figures.

LOGGING ON PENOBSCOT TRIBUTARIES.

The various tributaries of the Penobscot River where logging is carried on are: The West Branch, where, in the winter of 1902-3, 90,000,000 feet was cut; East Branch, 45,000,000; Mattawamkeag, 40,000,000; Piscataquis, 23,000,000, and Passadumkeag, 12,000,000.

The largest operations on the river are carried on by the Great Northern Paper Company, which in the winter of 1902-3 cut 23,000,000 feet on the West Branch and purchased a still greater quantity of various operators on those waters. In 1906 its cut and purchases amounted to 55,000,000 feet. Other large operators are John Ross & Son, C. W. Mullen, James Rice & Co., Marsh & Ayer, John Cassidy & Son, McLeod & McNulty,

Gilbert & McNulty, Maxfield & Ayer, John Largay, Twin Lakes Lumber Company, W. D. Smith, all of Bangor, and C. J. McLeod, of Oldtown, these concerns cutting from 3,000,000 to 8,000,000 feet each.

On the East Branch the larger operators are Ira B. Gardner & Sons, of Patten, who in 1902-3 cut 9,500,000 feet; Kellogg & Curran, of Patten; Katahdin Pulp & Paper Company and J. M. McNulty, of Bangor; Emerson Bros., of Island Falls; Cornelius Murphy & Sons, of Oldtown; E. B. Brown, of Patten; T. H. & P. Lawler, of Benedicta; J. & M. Leen, of Sherman; Rogers & Ross, of Bangor, and the Jordan Lumber Company, of Oldtown. On the Piscataquis the largest operators are Hussey, Goldthwaite & Hudson, who got about 7,000,000 feet in the winter of 1901-2; the Sterns Lumber Company, of Bangor, and Thomas Gilbert, of Orono, about 4,000,000 each.

The following shows the cut of 1905-6 on the two branches of the Penobscot:

LOG CUT OF 1905-6 ON BRANCHES OF THE PENOBSCOT.

EAST BRANCH.

	Feet.
Eagle Lake Company, Eagle Lake	18,000,000
Katahdin Pulp & Paper Company, Allaguash	6,000,000
Carpenter & McNulty, Chamberlain Lake	2,000,000
Carpenter & McNulty, East Branch	4,000,000
Tozier Bros., Webster Brook	1,500,000
C. Murphy & Son, Telos	5,000,000
Katahdin Pulp & Paper Company, Second Lake	2,000,000
Gardner & Finch, Hay Brook	2,500,000
B. W. Rowe & Company, Trout Brook	4,000,000
John Leen, Seboois	5,000,000
Brown & Gagnon, Seboois	1,000,000
G. W. Cunningham & Son, Seboois	1,500,000
Hugh Cunningham & Son, East Branch	3,000,000
Katahdin Pulp & Paper Company, Wissataquoix	1,500,000
Hathaway & Whittier, Seboois	800,000
Jordan Lumber Company, East Branch	1,000,000
Oscar Thomas, East Branch	1,000,000
Scattering on East Branch	6,000,000
Old logs	13,000,000
Total	78,800,000

WEST BRANCH.

Great Northern Paper Company	55,000,000
Getchell Brothers	1,000,000
Wentworth Maxfield	6,000,000
Sutherland & Hodge	2,000,000
Frank Morrison	2,000,000
Joshua Smith	1,500,000
John Cassidy & Son	2,000,000
Largay & Son	3,000,000
D. A. McLeod	5,000,000
Palmer Bros	2,000,000
Moses B. Wadleigh	2,000,000
John Ross	2,000,000
Henry Priest & Son	1,000,000
Charles W. Mullen	4,000,000
Total	88,500,000

DISTRIBUTION OF PENOBSCOT LOGS.

Of the Penobscot log crop about 100,000,000 feet goes to the pulp mills at Millinockett, Montague, Howland, Lincoln, Oldtown, Great Works, Orono and South Brewer. Of the sawlogs 25,000,000 feet is manufactured at mills in Guilford, Kingman and Island Falls, the remainder being

driven down to Penobscot boom, just above Oldtown, where the logs are sorted out and rafted to the mills below. In the busy season 300 men are employed at the boom and the work goes on from June to October. The logs intended for the steam mills at and below Bangor are sent down in drives of 3,000,000 to 8,000,000 feet to Bangor boom, located within the city limits at the head of tide water. Here the logs are sorted and made up into rafts, which are towed by steam tugs to the mills of their owners.

Formerly, the greater part of the logs cut on the Penobscot were sawed at water mills located along the river between Bangor and Oldtown, large plants being located at Veazie, Orono, Basin Mills, Great Works, West Great Works, Stillwater and Oldtown. Most of these old mills have long since fallen into decay or disuse, some having been burned and others torn down to make way for pulp mills, the steam mills on tide water, around Bangor, now sawing the greater part of the logs. These steam mills are generally of modern construction and equipment and are favorably located for the economical manufacture of all kinds of long and short lumber. A considerable proportion of the lumber sawed in mills along the river between Bangor and Oldtown is shipped by rail, but the entire output of the Bangor mills goes by water, the lumber going almost directly from the saws to the vessels, a distance of a few hundred feet, over live rolls.

The largest mill on the river is that of the Eastern Manufacturing Company, at South Brewer, of which company Fred W. Ayer is the president and ruling spirit. The equipment of the mill includes three band saws, and between 30,000,000 and 40,000,000 feet of long and short lumber is manufactured. A planing mill is run in connection, and all the waste of the sawmill is taken by a pulp mill close by, owned by the same company. The Eastern Manufacturing Company owns also a fleet of vessels in which most of the product of the mill is shipped.

The other mills on tide water are those of the Sterns Lumber Company at East Hampden; Lowell & Engel, East Hampden—both modern band sawmills; the Sargent Lumber Company, South Brewer; F. H. Strickland, Brewer, and Morse & Co., Bangor. The latter firm saws about 5,000,000 feet of hemlock, chiefly house frames for the local and Maine coast markets, besides considerable spruce and about 1,000,000 feet of pine yearly. In addition it conducts an extensive business in the manufacture of all kinds of house finish.

The mills between Bangor and Oldtown are those of James Walker & Co., at Basin Mills, Orono, said to be the largest water power mills in the country; William Engel & Co., Orono; Andrews & Gould, Great Works; Jordan Lumber Company, Oldtown, and Thatcher & Barker, Milford.

John L. Cutler located in Bangor in the fall of 1859 and entered into business with D. R. Stockwell and D. S. Chalmers under the name of D. R. Stockwell & Co. In 1870 he formed a partnership with B. B. Thatcher and Darius Eddy. The business continued under the name of Cutler, Thatcher & Co. for four years, when the firm became Cutler & Eddy. In 1885 Mr. Eddy retired and the firm was succeeded by Cutler & Co. In 1888 Mr. Cutler entered into partnership with Franklin Stetson, now deceased, under the name of Stetson, Cutler & Co., which became one of the most prominent firms in the trade. Mr. Cutler died June 15, 1904.

All the lumber manufactured on the Penobscot River is measured by a Surveyor General and his deputies. The Surveyor General is appointed by the commissioners of Penobscot County and has thirty deputies, each of whom has a gang of four overhaulers when at work on rafts. The overhaulers get seventeen cents a thousand feet, divided among them, for all lumber handled, which gives them from $3 to $4 a day each, according to conditions. The deputy surveyors get ten cents a thousand and earn as much as $10 a day under favorable circumstances. The Surveyor General gets one cent a thousand on all lumber surveyed in the county, practically all of which is handled at Bangor, and that makes his salary anywhere from $1,500 to $2,000 a year, according to the state of the lumber trade.

A résumé of the season of 1905 in the tide water sawmills of the Penobscot—those at and in the immediate vicinity of Bangor—shows that the six mills sawed a total of 99,324,826 feet, as follows: Eastern Manufacturing Company, 49,971,583; Lowell & Engel, 18,091,910; Sterns Lumber Company, 13,257,231; Sargent Lumber Company, 7,893,656; F. H. Strickland, 6,959,530; Morse & Co., 3,150,916.

This is the greatest quantity of lumber ever sawed in a season by the tide water mills. From the total survey of lumber sawed in Penobscot County it would appear that nearly two-thirds of the manufacturing business is done in Bangor and vicinity. Formerly, the proportions were exactly reversed as between the upriver mills and the mills on tide water.

CHAPTER V.

MAINE—THE WESTERN DISTRICTS.

The extreme southwestern part of Maine was the real birthplace of the lumber industry of the State, as it was of New England and of the United States. There it was first permanently established and attained proportions of importance for the time. As stated in Chapter I of this volume, probably the first sawmill in New England was built at York, Maine, soon after 1623, and the second on Salmon Falls River in the present township of South Berwick in 1631 or 1632. Possibly, wind power sawmills were erected on Manhattan Island, New York, at an earlier date, but these were a failure, leaving the credit with Maine and with this particular part of the Pine Tree State.

Forest industries, however, preceded even this early sawmill erection, for the first settlers at York, Saco and Newichwannock, now South Berwick, manufactured the pines and oaks by hand, riving the former into clapboards and shingles, and the latter into pipe staves. These productions formed a part of the return cargoes of the ships that came to the Piscataqua River in those early days. This hand production continued for at least two centuries, as machines for manufacturing staves and shingles were not invented until the Nineteenth Century had well advanced.

A compilation of early records in regard to these matters has been made by Mr. John E. Hobbs and was presented in the *Forest Quarterly.*[1] We quote somewhat freely from his compilation, both as a matter of record and as throwing light upon conditions and methods of those early days. After referring to a letter from Thomas Eyre to Ambrose Gibbins, as the factor of the Laconia Company at Newichwannock, he says:

> The next mention of a sawmill in the New World we find in the "Articles of Agreement" between John Mason on the one hand and James Wall, William Chadbourne and John Goddard on the other. This document is preserved in the archives of Massachusetts. "It is written on parchment in a remarkably legible, though peculiar, handwriting.[2] It is dated 14th March, 1633. It represents that John Mason owns certain lands in New England and especially an estate called Newichwannock lying upon and near to the Ryver there called the Pascataway; that he intends by God's permission by the first and next convenyent shipping to send to his said lands and there to place and settle servants and others; that he has agreed with the three individuals above

[1] *Forest Quarterly*, March, 1906.
[2] Rev. Dr. A. H. Quint, in his "Historical Memoranda of Dover," New Hampshire, p. 369.

named that they are to 'go over into the said lands' and to stay there for five years, in which time they are to cut timber, build dwelling-houses, erect two mills 'and perform such other work' as the said John wants done."

A year or more passed after the making of this contract before Captain Mason found "shipping" in which to send the mills and men to the "Pascataway," as can be learned from the correspondence between Captain Mason and Ambrose Gibbins.

The location and character of these mills and the term of their occupancy we learn from the deposition of Mr. James Wall, one of the three carpenters, taken and sworn to before George Smyth on the 21st of the third month 1652, namely at Ashbenbedick Falls, a corn mill and a sawmill being run for three or four years.[3]

The short life of these mills may have been occasioned by a freshet, as may reasonably be inferred from the following deposition of Mr. James Johnson, aged fifty years "or thare abouts: this deponent saith that upon the steep falls beyond Thomas Spencer' house there stood part of a mill which was said to be Capt. Mason' 16 years since, to the best of my remembrance and farther saith not."

In corroboration we find the deposition[4] of Thomas Small, of Piscataqua, in New England, planter, aged sixty-five years, who states that he hath lived in New England upwards of fifty years—and "that the deponent doth very well remember that Capt. Mason sent into this country eight Danes to build mills to saw timber and tend them, and to make potashes; and that the first saw-mill and corn-mill in New England was erected at Capt. Mason's plantation at Newichwannock upwards of fifty years—where was also a large house and conveniences of outhouses, and well fortified with store of arms. That about forty years since the said house and buildings were burned to the ground, but by what means the deponent doth not know—Sworn 8th Sept., 1685, at Portsmouth." . . .

About this time grants were made of timber lands on all the branches of the Piscataqua. Just then there was great activity manifested in the development of lumbering as an industry. Sawmills began to multiply and their capacity was enlarged. In 1650 a mill carrying eighteen saws moved by one wheel was erected on the Assabumbedeck Falls, the site of the sawmill and corn mill erected in 1634, which was the first gang sawmill of which we have any account on this continent.

We learn from the Kittery records that in 1650 the following grant of land was made to Richard Leader, who had been elected a councilor of the Province in 1646. "Whereas at a court held at Kittery, on the 11th day of March, 1650, Mr. Richard Leader made certain propositions for the erection of mills at Newichwannock, it is ordered therefore by this court and the consent of the county, that the aforesaid Richard Leader, his heirs and assigns, shall have sole property and privilege of the little river at Newichwannock, commonly called or known by that name to erect a mill or mills upon the river aforesaid, together with like property and liberty of all such timber as is not yet appropriated to any town or person." The magnitude of Mr. Leader's operations soon gave the name of Great Works to the place, which afterwards became the name of the river.

In 1654 there was granted to him all the pine trees up the little river, so far as the town bounds went, for the accommodation of his mill. Following the course of the river this would be about twenty miles. For the privilege of cutting the timber he was to pay the town a tax or royalty of £15 currency.

These sawmills had not been running many years before the citizens found it necessary to make regulations to guard against the wasteful cutting of trees for clap-

[3] Belknap's "History of New Hampshire" p. 428, and "Provincial Papers, New Hampshire," Vol. I, p. 89.

[4] From "New Hampshire Provincial Papers," Vol I, p 45.

boards and pipe staves, as appears from the regulations made in Kittery and Dover and Portsmouth regarding the cutting of such trees.

In Kittery, in 1656, it was ordered that if any inhabitant should fall any pipe stave or clapboard timber and let lay unused up one month, any other inhabitant might improve it as his own property. Previous to this it had been ordered that no inhabitant could have more than five trees of each kind allotted him at one time for the purpose. At a town meeting of the inhabitants of Portsmouth in 1660 a penalty of five shillings for every tree was imposed upon any inhabitant for cutting timber or any other wood from off the common, except for their own building, fencing or firewood.

Elsewhere restrictions in the use of timber were enacted:[5]

"It is this day ordered that noe inhabitant shall fall above tenne trees for clapboards or pipe-staves until he hath wrought—y and he that shall have above Tenne Trees fallen at any time not wrought up shall forfeit for evrie Tree Tenne shillings."

"It is this day ordered that noe man shall fall any timber for clapboards or pipe-staves, plank or boards without approbation of the Townsmen."

These regulations show that the manufacture of clapboards and pipe staves was a common business, and the reference to plank and boards is evidence that sawmills were in use here at this time.

Again: "At a meeting of the Selectmen holden the 25th of 10th mo. 1665. Ordered that whereas many persons doe fall Timber and make staves without order and take in several inmates for that end, whereby the town and the settled inhabitants are much injured, these are therefore to impower John Roberts, Thomas Nock and Phillip Chesley or any two of them to make dilligent sarch into all the woods, and when they find any that hath trangressed town orders in making staves of felling timber, what they find they shall sease for the use of the towne, the informers shall have the one half for their Paynes and the other to be returned into the Towne Treasury."

It will be observed that this third order was made twenty-three years after the first, and yet there were timber trees suitable for the manufacture of clapboards and pipe staves to be protected from wasteful cutting, which fact shows the wisdom of the orders.

It appears that prisoners in the jails were sometimes employed in making shingles, as we learn from a letter from William Vaughan, Esq., containing a journal of transactions during his imprisonment, etc., to Nathaniel Weare, Esq., Agent in London, March 17, 1683:[6] "The governor (Cranfield) having formerly prohibited the prisoners from making shingles, went himself this day to the prison and prohibited John Partridge from making shoes: bade the marshall throw them into the sea."

We find the following interesting bit of history in "Old Eliot," Vol. IV, p. 182, copied from Egerton MSS. 2395, British Museum, ff. 397-411. Extract by Dr. C. E. Banks:

"Nichequiwanick. About three miles from Agomentine [Agamenticus?] is the River Pascataway, which is six miles from the mouth. It brancheth itself in two branches, the South branch of which retaineth the name of Pascataway, the other Nichiquiwanick. . . . At the falls of Nichiquiwanick three excellent saw mills are seated, and there and downward that side [the Maine side] of ye river have been gotten most of the masts which have come for England, and, among the rest, that admired mast which came over some time last year, containing nere 30 tunes of timber as I have been informed."

Unfortunately this extract does not give the date of the paper, but from other

[5] "Historical Memoranda of Dover," p. 32. 164, 11, 6mo. and p. 33, 8, 12mo. 1643.
[6] Belknap's "History of New Hampshire," p. 483.

statements in it we infer that it was written soon after Maine was annexed to Massachusetts in 1652. About this time there were three sawmills running at Newichwannock. . . .

About the time of the making of the regulations to prevent waste in the cutting of clapboards and pipe stave timber, it was found necessary by several of the New England colonies to make stringent regulations designed to guard against damage to the woods by fires. Great forest fires must have occurred in those early days as they have frequently occurred since.

Williamson tells us of a great forest fire that occurred one hundred years later, which began in New Hampshire and spread into Maine. He says: "Early in July, 1762, devouring fires did immense damage to the woods in New Hampshire and spread into Maine. They burst forth from the woods of New Hampshire and, burning with irresistible fury, passed through Towok (now Lebanon) in Maine, and being driven by the winds to the eastward, entered Scarborough, Gorhamtown, New Casco (Portland), and the neighboring forests, where they raged till they were only checked by a flood of rain which fell on the 19th and 20th of August. Even the cattle in many places did not escape the violence of devouring fire. A prodigious quantity of the most valuable forest timber was destroyed, besides houses and sawmills."

This fire covered a distance of about fifty miles from its starting point in an easterly direction and must have burned itself out at Casco Bay, north of Portland. As the country north of this was unbroken forest to the "River of Canada," it must have burned over an immense area in that direction. We cannot well imagine the damage that would be done by such a fire burning for a month or more in an unbroken forest.

Belknap tells us that as early as 1668 the government of Massachusetts, under which the provinces of Maine and New Hampshire then were, had reserved for the public use all white pine trees of twenty-four inches in diameter at three feet from the ground. These trees were reserved for masts for the King's navy. The Government had a monopoly of trade in masts and maintained it up to the time of the Revolution.

Sullivan tells us that the charter of 1692 incorporated the Province of Maine and lands between Nova Scotia and Sagadahoc[7] River with the old Colony of Massachusetts, with the provision that the General Court should not grant any lands in Acadie, or east of the Kennebec River without the consent of the Crown. In the charter there was a reservation of all the pine trees of twenty-four inches in diameter for the use of His Majesty, his heirs and successors. Acts of Parliament prohibited the cutting of pine trees on this reservation under very severe penalties recoverable in the admiralty courts. The Crown would not trust a jury to try causes arising on the supposed breaches of these acts of Parliament. Agents were appointed to take care of the pine trees; but as the country was cleared, fires were kindled, which ran into the forests and destroyed the pine timber wherever they came. Moreover, as the forest trees were cut down, the tall pines became unable, when unshielded against the wind by the lesser woods, to withstand the storms. The agents, generally for their own emolument, gave license to cut such trees for other uses as would not answer for navy masts, and sent deputies to mark the trees which were to be preserved. This was usually managed on the principle of bribery and corruption, and, while the agent and his deputies became rich, great havoc was made among the King's trees. . . .

If the wise regulations for guarding against the waste of timber on the common lands so early enacted by the "townsmen" of Dover, Portsmouth and Kittery (Berwick being then part of Kittery) had been generally adopted throughout the colonies and continued and enforced by their successors to the present day, there would have been

[7] An early name for the Kennebec River

no danger of a timber famine in this country for a long time to come. The wild lands of Maine and the White Mountain region of New Hampshire, comprising in extent nearly one-half the area of those states, would have been public property today instead of being in the hands of a coterie of lumber kings. But since those early days the vast forests, which then covered and adorned the continent and which had often been renewed by the processes of nature, have been largely displaced by the hand of man, and the agency of man in hewing and burning down these forests has so far outstripped their natural reproduction that the present generation is compelled to consider the best methods of conserving what now remains.

In 1639 John Winter, of Cape Elizabeth, Cumberland County, sent to England in the bark *Richmond* 6,000 pipe staves. After the death of Winter, about the year 1648, the commerce of that place declined, its population diminished and after the first Indian war it ceased to be a place of any business of importance.[8]

Settlements were commenced at Kittery as early as 1623, and it is related that lumber was manufactured there in 1636, or before. South Berwick was originally a part of Kittery and was settled simultaneously with Strawberry Bank, now Portsmouth. The first settlers were attracted to that location because it was one dense forest of pine, hemlock and oak, and because of the facilities afforded for lumbering. There was a sawmill on the Saco as early as 1653.

Major William Phillips, of Boston, removed to the Saco about the year 1660, and became a speculator in timber lands, a lumberer and a mill proprietor. John Alden—son of the *Mayflower* Pilgrim of the same name and of the arch Priscilla Mullen, whom Miles Standish desired for a wife—married his daughter, passed some time at Saco, and was interested in similar adventures. Another large land and mill owner on the same river was Sir William Pepperell, who commanded the expedition against Louisburg and was the only baronet of New England birth during our colonial history. His usual dress was of scarlet cloth trimmed with gold lace. Those who are acquainted with the peculiarities of the rough men with whom his business required him to mingle, can easily fancy their queer sayings at seeing one of as humble origin as themselves thus richly appareled.

In 1685 as many as four sawmills were in operation at Cape Porpoise, a short distance south of Biddeford. A town meeting gave the right to set up a saw, provided it was done "within sixteen months, unless prevented by war;" and the applicant furnished his townsmen with lumber for their own use, at "12 pence the hundred under prices current." Another person, at the same place, was required to pay "40 shillings rent as a tax to support Fort Loyal at Falmouth;" and a third had his request granted by paying "a yearly rent of 50 shillings," and allowed "the inhabitants to saw their own boards at the halves."[9]

[8] "History and Description of New England," Coolidge and Mansfield, 1859.
[9] *North American Review*, Vol. LVIII, 1844.

The curious terms annexed to "libertie" to make boards and planks by water power, in the olden time, are well worth a moment's attention. In the grant of the "townsmen of Saco" to Roger Spencer, it was stipulated that he should build his mill within a year, that all the "townsmen should have bordes twelve pence in a hundred cheaper than any stranger," and that the townsmen who would "worke" in erecting the mill "as cheap as a stranger," should have the preference. In the subsequent grant to another person, according to the *North American Review*, 1844, much the same conditions are imposed, and the further one that the grantee should buy his provisions of the townsmen at "prices current," rather than of others.

The chief occupation of the first settlers of Alfred, York County, seems to have been lumbering. Several saw and grist mills were early erected; and mechanics of almost every kind began to locate themselves in the neighborhood of the mills. The first settler in Alfred moved there in 1764.[10]

In 1768 a sawmill was built on Long Island in Casco Bay, called the "Improvement."[11]

The first sawmill erected in Buxton, York County, was built in 1770. About one mile up the river from that place is the village of Barr Mills, so called from a bar of rock which extends entirely across the Saco River. The first mills at that place were erected in 1795.[10]

While southwestern Maine antedated other regions of the State in the development of the lumber industry, it was, at a comparatively early date in the civilization of the country and the establishment of the colonies, outstripped by the Penobscot and other sections which still retain prestige as points of lumber production, and its early glory as a lumber region has departed. Longer rivers draining a greater area enjoy larger resources and longer life in the industry. That region is now of greater interest to the lumber historian because of its past than it is to the lumber economist for its present.

Along the Saco and Mousam the larger pine has now disappeared, and the cut, all second growth, is manufactured largely into match blocks and box boards. On the Saco, in the season of 1902-3, the cut was about 17,000,000 feet. Five years previous it was 30,000,000 feet. A few millions of feet, mostly small pine, are cut on the Mousam and other streams in Yorktown.

The spruce growth on the headwaters of the Androscoggin River is declared by foresters to be the finest in New England, and extensive operations are carried on there, chiefly by a few large concerns. Formerly, pine was plentiful in that region and lumbering up to about 1857 was con-

[10] "History and Description of New England, Coolidge and Mansfield, 1859
[11] *Bangor Historical Magazine*, Vol VI, 1891

fined to that species, the first large mills having been located at Brunswick, far down the river.

There were mills at Brunswick as early as 1716.[12]

There was a sawmill at Damariscotta under grants from the hated Dunbar (second surveyor of the woods in America) in 1730. There was located Lieutenant Colonel William Vaughan, a son of a lieutenant governor of New Hampshire, who was associated with Major William Phillips, of Boston, in sawmill enterprises on the Saco River. Mr. Vaughan had secured his title to land and mill sites from Surveyor General Dunbar. He is described as a bold projector and died in England while urging his claims for services in the war of 1745.[12]

The first sawmill and grist mill in Chesterville, Franklin County, was put into motion in 1785.[13]

Of Brunswick, at a later date, W. D. Williamson states, on page 46, Volume I, of his "History of Maine," published in 1832: "On these falls ['the cataracts of the Pejepscot, or Brunswick Falls'] are twenty-five sawmills, each of which will, on an average, annually cut 500,000 feet of boards. They employ about 300 men. Here also were carding machines, fulling mills, and factories; 1,488 cotton and woolen spindles, and twenty-four looms whose warping and sizing machines were moved by water power. The water in the freshets not infrequently rises in the river twenty feet; and in 1814 immense damage was done by the uncommon flood which brought down mills, barns, masts, logs and trees, over the falls, in undistinguished ruin." Mr. Williamson's data, however, may concern an earlier date, as the looms to which he refers were destroyed by fire in 1825. About 1852 mills were built at Lewiston, while at the same time the Grand Trunk Railway was extended to Berlin, New Hampshire, and mills were built on the falls at that point. In the same year dams were built on the headwater lakes, and drives of logs from that region, which had until then been small and uncertain, became regular and of large amount, no spruce, however, coming from the lake region until 1862, on account of the length and difficulty of the drive. Much of the cutting on the Androscoggin is done on the New Hampshire side of the line, the cutting on the Maine side, mostly in the Rangeley Lake region, being comparatively light; so that, although operations there have been going on for thirty-five years, the growth is still heavy and in some sections, as about Cupsuptic and Kennebago lakes, the length and difficulty of the drives have prevented any considerable inroads into the spruce, which today remains practically as good a stand as it was fifty years ago.

The cut on the Androscoggin in recent years has ranged from 150,000,-

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[12] *North American Review*, Vol. LVIII, 1844.
[13] "History and Description of New England," Coolidge and Mansfield, 1859.

000 to 200,000,000 feet, largely on the New Hampshire side. In the winter of 1901-2 the cut was about 175,000,000 feet, of which probably 125,000,000 feet went to the Maine pulp mills. The Androscoggin cut of 1902-3 was approximately 140,000,000 feet for Maine. (The river is partly in New Hampshire and some of the cut remains in that State.) The cut of 1903-4 on the Androscoggin for Maine mills was approximately 125,000,000 feet. The American Realty Company, which supplies the pulp used by the mills of the International Paper Company, had contracts on the Androscoggin in that winter calling for 100,000,000 feet of spruce, the cutting being about equally divided between Maine and New Hampshire. The Berlin Mills Company[14] cut between 30,000,000 and 40,000,000 feet, and the Blanchard & Twitchell Company, of Berlin, about 20,000,000. Most of the small operators contract their cut to the American Realty Company.

The great pulp mills on the Androscoggin are located at Berlin, New Hampshire, and at Rumford Falls, Livermore Falls, Poland and Lisbon Falls, Maine, and the sawmills chiefly at Gorham, Shelburne and Berlin, New Hampshire, and at Rumford, Canton, Lisbon, Lewiston, Brunswick and Topsham, Maine. A considerable part of the Androscoggin logs is transported by rail.

The majority of the large towns of Maine are in the western part of the State and include such cities as Augusta, the capital, Waterville, Brunswick, Bath, Auburn, Biddeford and Portland. The last named is the largest city of the State and the commercial center of western, as Bangor is of eastern, Maine; but its prominence is not confined to state boundaries, for, as a railroad terminus and in possession of a magnificent harbor, it has an export and import trade of importance and is a port from which lines run to various Atlantic ports in America, and also, during the winter season, to Liverpool. Its present prominence in the lumber business is due to its commercial eminence and not to the possession of a lumber producing business, although it does a respectable business in remanu-

[14] Among the heaviest timber owners and operators in New England is the Berlin Mills Company, of Portland, Maine, but whose chief manufacturing operations are in New Hampshire, centering at Berlin Mills. This business was begun about 1853 by Judge Little, who was connected with the Grand Trunk Railway. In its early history it was styled H. Winslow & Co. and was managed by Hezekiah Winslow, an ex-seacaptain. Later, J. B. Brown, a sugar man of Portland, bought the controlling interest in the business and changed its name on January 1, 1869, to the Berlin Mills Company. Still later, W. W. Brown and Lewis T. Brown purchased the controlling interest, buying out J. B. Brown and also the widow of Mr. Little. The concern continued as a partnership and in 1878 two new partners were taken in—J. W. Parker and Thomas Edwards. Lewis T. Brown died, but the business was continued as a partnership until 1888, when it was incorporated as the Berlin Mills Company. At that time the officers were W. W. Brown, president; J. W. Parker, vice president, and Thomas Edwards, treasurer. In 1896 J. W. Parker sold his interest. The present ownership consists of W. W. Brown and his two sons, H. J. and O. B. Brown. This business began in a modest way, but soon adopted the policy of buying timber lands and now has about 400,000 acres, mainly in Oxford and Franklin counties, Maine, and Coos County, New Hampshire. About 1870, and early in the history of the company, land was secured at about $1 an acre and some as low as sixty cents. This company was among the first of the operators in spruce and its purchases were mainly of spruce lands. It began its sawmill business by buying and sawing small quantities of pine, but as most of the pine had been cut out, even at that time, it devoted its attention to spruce, of which it is among the larger handlers in the country. Of late years it has paid less attention to the lumber business and has made heavy investments in pulp and paper mills.

facture of lumber. Situated on no stream of importance it has never, as a lumber producing point, compared with a number of other Maine cities. Its early lumber industry was established chiefly to meet local demands and was supplied by timber of local growth. Its foreign commerce will be treated in a succeeding chapter devoted to the statistics of the forest industries of Maine. As a terminus of the Grand Trunk Railway it is a point of winter shipment for forest products of Canada, as well as one that draws supplies from a wide range of territory in Maine and New Hampshire.

Portland was first occupied in 1623, when Christopher Levett, of York, England, visited Maine and, under a patent embracing the present site of Portland, built on one of the islands of the harbor a fort in which he placed a small garrison. The project failed, owing to the war between England and France, and the locality remained uninhabited by Europeans until 1632, when George Cleeve and Richard Tucker, of England, made a settlement at the end of the peninsula, within the limits of the present city of Portland. Under the Cleeve and Tucker patent the place was called Stogomor, but was shortly changed to Casco Neck, while in 1658 its name was again changed to Falmouth. The infant town was destroyed by the Indians and the French, but was resettled in 1714, although in 1716 it had but fifteen male inhabitants. Its present population is about 60,000.

It has an extensive list of individuals, firms and companies engaged in one way or another in the lumber business. It handles and ships lumber in all its forms and has numerous factories producing sash, doors, blinds, furniture, boxes, etc. The heaviest capital, however, is represented by concerns whose chief lumber operations are simply directed from Portland as business headquarters. Among those who might especially be mentioned are: The Fred E. Allen Company, cooperage; the Saguenay Lumber Company, interested in Canada; St. John Lumber Company, manufacturer of spruce lumber at Van Buren, in the northeast extremity of Maine; the Rufus Deering Company, lumber dealer and shipper; the Frank Dudley Estate, lumber exporter and interested in timber lands and lumbering operations in various parts of the country; J. H. Hamlen & Son, lumber and cooperage exporters with manufacturing connections in Arkansas; the Merrett Lumber Company, lumber importer, and the Berlin Mills Company.

THE KENNEBEC RIVER DISTRICT.

The exact date of the erection of the first sawmill on the Kennebec is difficult to ascertain, but it is certain that there were mills on that river early in the Eighteenth Century. Dr. Noyes, of Boston, one of the Plym-

outh proprietors, in 1716 built on the bank of the Kennebec, at Cushenoc, a name that has disappeared from the ordinary geographies, a fort of stone near the head of the tide, and it is said to have been the best fortification in the eastern country. There a garrison was, for a period, maintained at public expense, and, so great was the encouragement given, "that several towns, as Brunswick, Topsham, Georgetown and Cushenoc, began to be settled. A great many fine buildings and sawmills were erected; husbandry began to thrive, and great stocks of cattle were raised." Thereafter vast quantities of pine boards, plank, hogshead, pipe and barrel staves and all sorts of timber were annually transported from the river Sagadahoc to foreign places as well as to Boston.[15]

The first European who is known to have landed in Bath, the capital of Sagadahoc County, was Captain George Weymouth, who explored this part of the coast of Maine in the summer of 1605. He sailed up the Kennebec River, and, wishing to know the quality of the soil and its adaptation to husbandry, took his boat and a part of the crew and landed. He says: "We passed over very good ground, pleasant and fertile, and fit for pasture, having but little wood, and that oak, like that standing in our pastures in England, good and clear, fit timber for any use, there were also some small birch, hazel, and brake, which could easily be cleared away and make good arable land." No attempt, however, was made to settle there by an European until as late as 1660. There are said to have been mills at Woolwich, Sagadahoc County, as early as that year. The settlement progressed so exceedingly slow that for upwards of three-quarters of a century only a sufficient number of persons had collected there to form a parish. The town was favorably situated for commercial enterprises, being located on the bank of a river extending far into the interior of a country abounding with valuable ship timber much sought after by the maritime powers of Europe. On the conclusion of peace with Great Britain, when the restrictive measures that had been imposed upon American trade were removed and the channels of commercial enterprise were opened, the inhabitants became actively and profitably engaged in lumbering and shipbuilding.[16]

Sawmills were built on the Kennebec River at what is now Gardiner in 1754, and for fifty years the manufacture of lumber was carried on in a small way.

As early as the Eighteenth Century the bold plan was conceived in Maine of rafting timber from America to England. Following the initial attempt several rafts were formed. All of them were successfully launched, but all unfortunately came to grief before reaching their destination. In

[15] "History of Maine," W. D. Williamson, 1832.
[16] "History and Description of New England," Coolidge and Mansfield, 1859.

1792 a raft containing about 1,000 tons of timber was built at Swan Island, in the Kennebec, by Doctor Tupper, a somewhat noted and eccentric character. It was made by treenailing square timber together in the form of a ship's hull, and was ship rigged, the intention being to send her across to England. At that time no manufactured lumber was admitted to the ports of Great Britain; hence, the timber in the raft was simply squared with the ax, to make it stow well. The ship or raft lay at Bath for some time, it being difficult to get men to go in her. She finally went to sea, however, carrying a small vessel on her deck. But off the Labrador Coast her crew became frightened by bad weather and abandoned her. She was afterward boarded by men from a passing vessel and found to be in good order, and it was suspected that she was deserted without sufficient cause. Two other similar attempts were made from the Kennebec, and both vessels went safely across, but foundered on the English Coast, under the same suspicions of fraud as in the case of the Tupper ship. In 1825 the ship *Baron of Renfrew* was launched at Quebec, having made a previous unsuccessful attempt when she stopped on her way, owing to the grease being consumed by fire from friction. She was towed down to the Island of Orleans and anchored. Her dimensions are given as follows: Length, 309 feet; breadth, 60 feet; depth, 38 internally and 57 externally; tonnage, 5,888 tons; draft when launched, 24 feet; cargo on board when launched, 4,000 tons of timber. She was ship rigged, with four masts, and was perfectly flat bottom, with a keel of about twelve inches; wall sided, sharp forward and rather lean aft, and looked more like a block of buildings than a ship. She sailed in August, 1825, drawing thirty-six feet of water, in command of a Scotchman, a half-pay lieutenant in the British navy. October 27, the *Baron of Renfrew* drove on shore on the coast of France, near Calais, and went to pieces.

F. André Michaux, during his travels in this country in 1801-7, visited the Kennebec River, and, in speaking of white pine and his observations on the Kennebec, said:

> I have seen the largest stocks in the bottom of soft, friable and fertile valleys, on the banks of rivers composed of deep, cool, black sand, and in swamps filled with the white cedar and covered with a thick and constantly humid carpet of *sphagnum*. Near Norridgewock, on the river Kennebec, in one of the swamps, which is accessible only in midsummer, I measured two trunks felled for canoes, of which one was 154 feet long and fifty-four inches in diameter, and the other 142 feet long and forty-four inches in diameter, at three feet from the ground.
>
> In the District of Maine it is employed for barrels to contain salted fish, especially the variety called sapling pine, which is of a stronger consistence. For the magnificent wooden bridges over the Schuylkill at Philadelphia, and the Delaware at Trenton, and for those which unite Cambridge and Charlestown with Boston, of which the first is 1,500 and the second 3,000 feet in length, the white pine has been chosen for its durability. It serves exclusively for the masts of the numerous vessels constructed in the

northern and middle states, and for this purpose it would be difficult to replace it in North America. Before the War of Independence, England is said to have furnished herself with masts from the United States, and she still completes from America the demand which cannot be fully supplied from the north of Europe. The finest timber of this species is brought from Maine, and particularly from the river Kennebec.

All the logs that come down the Kennebec are stopped at Winslow, about one hundred and twenty miles from the sea, where each person selects his own, and forms them into rafts with the intention of selling them to the proprietors of the numerous sawmills between that place and the sea or of having them sawn for his own benefit at the price of a half or even of three-quarters of the product in abundant years.

When I was at Winslow in 1806 the river was still covered with the thousands of logs, of which the diameter of the greater part was fifteen or sixteen inches, and that of the remainder (perhaps one-fifth of the whole) twenty inches. The blue ash and the red pine were the only species mingled with them, and these not in the proportion of one to a hundred.

Seward Potter is said to have been the first man to introduce steam into a sawmill in Maine. His partners in the mill were Aaron Taylor and John Gordon. This mill was built at Bath in 1820 and remained until in 1836, when it was moved and the Jewell & Henry Mill Company built another. This mill stood until 1853, when it was taken down. From that time until 1883 the yard was used for shipbuilding. M. G. Shaw & Sons in that year erected a new mill on the site of these pioneer mills.

Among the first to recognize the value of the Maine forests was Eleazar Coburn, a farmer, surveyor and member of both branches of the legislature. In 1830, in partnership with his two sons, Abner Coburn and Philander Coburn, he formed the firm of E. Coburn & Sons. Abner was a land surveyor also, and from their work in the forests the Coburns had acquired an intimate knowledge of the resources of the northern part of the State and knew the locations of the best tracts of timber. As a result they bought at low prices large tracts of choice timber, which they manufactured along the Kennebec River. The Coburns at one time or another owned 450,000 acres of Maine timber land, besides 50,000 acres of land in the West. Abner Coburn became Governor of the State. He bequeathed $900,000 to various institutions and left property worth several millions of dollars to his heirs.

In the first half of the Nineteenth Century pine was the only lumber cut, and, as on the Penobscot, there was great waste, although the total quantity cut was small compared with that on the Penobscot. No spruce was cut on the Kennebec until about 1850, at which time the pine had been largely exhausted, while fires had also made inroads into the spruce. The Kennebec logs are cut chiefly upon that river's tributaries—Sandy River, Carrebasset Stream, Dead and Moose rivers—and around Moosehead Lake, which is the great supply reservoir of the Kennebec.

By means of a sluice at Northwest Carry, a large number of logs cut on the north and south branches of the Penobscot are conveyed into Moosehead Lake, towed across the lake and thence sent down the Kennebec. A dam was built at Seboomook Falls, on the West Branch of the Penobscot and a large area of lowlands thus flooded, forming what is known as Carry Pond. Here, on high water in the spring, logs are floated to within 300 yards of the divide between the Penobscot and Kennebec waters, over which they are carried by an endless chain, operated by powerful engines, and turned into the sluice. The Bradstreets, of South Gardiner, were most active in the development of this plan, and for years they have thus diverted annually from the Penobscot to the Kennebec waters 8,000,000 to 10,000,000 feet of logs. Considerable quantities of logs are also brought to the outlet of Moosehead Lake by the Canadian Pacific Railway and sent thence down the Kennebec.

The cut on the Kennebec has averaged in the last fifteen years about 130,000,000 feet, and about half of the logs have lately been used by the pulp mills, the Hollingsworth & Whitney Company, at Winslow and Gardiner, requiring 30,000,000 and the Great Northern Paper Company, at Madison, upwards of 20,000,000 feet. The principal sawmills are those of the T. W. Fogg Lumber Company, at Bowdoinham; Lawrence Bros. Company, South Gardiner; South Gardiner Lumber Company, South Gardiner; Berlin Mills Company, Farmingdale; Augusta Lumber Company, Augusta; W. T. Reynolds, Winslow; Lawrence, Newhall & Page Company, Shawmut; F. T. Bradstreet, Richmond, and the M. G. Shaw[17] Lumber Company, Bath.

It is on the Kennebec waters that the latest contrivances in Maine

[17] Milton G. Shaw, president of the M. G. Shaw Lumber Company, who died at his home in Bath, September 18, 1903, at the age of eighty-three years, was so prominently identified with the lumber industry on the Kennebec and his operations were so typical of the best lumbering practice of Maine, that special mention of his career, which covered sixty-two years of active identification with the lumber business, is deserved. He was born in the town of Industry, the son of a farmer who was one of the first settlers and cleared his farm in the woods. In 1841 young Shaw went to work in a lumber camp in Flagstaff Township, where Benedict Arnold camped on his famous march to Quebec. In building a dam on Dead River at Flagstaff a few years ago, workmen found three or four quarts of ancient lead bullets in the crevices of the rocks which were undoubtedly left there by Arnold. Mr. Shaw's first work was for his brothers Albert and Daniel, the latter afterward becoming prominent on the Chippewa River in Wisconsin, and it was not until 1845 that he began business for himself. In the fall of that year he located at Greenville at the foot of Moosehead Lake, which was ever after the center of his operations. He lived there for forty years, cutting spruce and pine logs, operating a farm and carrying on the largest general store in Maine. In 1855 he began to buy timber lands, and in 1883 he built at Bath, near the mouth of the Kennebec River, what was then one of the largest sawmills in the State. During his long career he had many partners and associates, but at the time of his death the only other stockholders in the company were his sons, the organization being Milton G. Shaw, president; Albert H. Shaw, treasurer and manager, and William H. Shaw, clerk. Mr. Shaw's lumbering experience covered practically the whole of what may be called the modern era of lumbering in Maine. When he began his career in the early '40's the pine on Moosehead waters had been pretty well cut over. When he was working for his brothers in 1841-5 they cut pine exclusively, but when, in the latter year, Mr. Shaw began logging on his own account he devoted his attention chiefly to spruce. Mr. Shaw's first purchase of timber land was in 1859 when he bought a half interest in 15,000 acres at twenty-five cents an acre. Shortly after that he bought, with ex-Governor Coburn, Joseph Bradstreet, Elias Milliken and others, who were leaders among Maine lumbermen, a large tract at $1.25 and $1.50 an acre. These lands, after being cut over and over again, and without value for agricultural purposes, are now worth from $4 to $6 an acre. In the early '50's the best spruce on Moosehead waters could be bought for $1 a thousand stumpage; today in the same region stumpage is from $3 to $6 a thousand. When Mr. Shaw began logging the sawmills were all equipped with the old fashioned sash saws. Later came the mulay and the gang and it was not until about 1860, according to Mr. Shaw's reminiscences, that the

logging, the steam and electric log haulers, have been brought into use, by the Lawrence, Newhall & Page Company in its operations on Alder Stream, above Eustis. Both machines are the invention of A. O. Lombard, of Waterville, who built them. The steam hauler is equipped with a 25-horsepower boiler and engine and weighs fourteen tons. In six experimental trips it hauled 58,000 feet of logs over a seven-mile road, the largest load scaling 17,280 feet. The electric machine is operated on the trolley system, power being supplied from a station situated at the foot of a cascade 200 feet below the road, a current also being supplied for lighting the road. Both machines, it is said, are practical successes, hauling logs cheaper than the work can be done by horses.

Gardiner has been called the "Lumber City of the Kennebec." The mills of the city and vicinity have a capacity of 60,000,000 feet a year. These include the plants of the South Gardiner Lumber Company, Lawrence Bros. Company, H. W. Jewett & Co., Joshua Gray & Son, R. T. Hayes & Co., Putnam & Closson (at Randolph), O. H. Moulten (at Randolph) and G. A. & C. M. Phillips (at Farmingdale).

THE KENNEBEC LOG CUT.

On the Kennebec no account has ever been kept to show the proportions of spruce, pine and other kinds of lumber making up the cut. All logs are assessed by the driving contractors on woods survey and no boom record is kept. Following is a statement of the number of feet of logs driven down the Kennebec every year since 1866:

THE LOG DRIVE OF THE KENNEBEC—QUANTITY.

Year.	Feet	Year.	Feet.
1866	47,035,278	1887	160,975,657
1867	75,635,602	1888	137,375,736
1868	52,044,483	1889	134,644,947
1869	91,436,205	1890	168,882,451
1870	80,881,519	1891	147,460,585
1871	81,701,944	1892	130,125,015
1872	119,578,190	1893	188,446,509
1873	128 695,162	1894	129,716,614
1874	97,427,499	1895	119,984,514
1875	105,178,938	1896	118,201,902
1876	113,646,782	1897	142,511,888
1877	50,698,148	1898	101,444,363
1878	93,500,719	1899	107,052,801
1879	82,667,270	1900	147,424,579
1880	77,044,898	1901	137,063,291
1881	144,379,343	1902	133,772,010
1882	127,332,195	1903	146,413,732
1883	124,247,085	1904	133,200 000
1884	106,187,334	1905	132,025,000
1885	105,702,925	1906	145 860,000
1886	103,489,535		

circular saw began to make its appearance in the mills of Maine. Later came the band saw. During the sixty years that Mr. Shaw was prominent in the lumber business on Moosehead Lake and the Kennebec River, he not only built up a great fortune for himself but the timber holdings which he left provide for a large business of indefinite duration. He always cut nothing less than eight inches in top diameter of twenty-foot lengths or seven inches of thirty-foot lengths, which means about twelve inches on the stump. Strict adherence to this rule enabled the Shaws to cut over their lands several times and still leave a fine growth of young trees. Mr. Shaw removed to Bath in 1883, where he resided till the time of his death. He was not only a prominent figure in that city but in Rumford Falls, where he owned much real estate and was prominent in financial matters. He was also a stockholder in the Machias Lumber Company and identified with various industrial, commercial and financial institutions.

CHAPTER VI.

MAINE—THE EASTERN DISTRICTS.

History records many instances in which great calamities have given impetus to new civilization by the compelling of migration resulting in the settlement and development of new countries. Wars, famine, pestilence, religious intolerance, have all, at times, been responsible for such movements of the people. The development of the lumber industry of eastern Maine was directly due to great forest fires which ravaged New Hampshire and swept over the western part of the present State of Maine in 1761 and 1762. Living, as they did, in the forest and very largely depending upon the forests for their means of livelihood, a considerable portion of the inhabitants of the ravaged section removed beyond the Penobscot in search of forests to take the place of those that had gone.

Earlier attempts at the settlement of eastern Maine had not been highly successful. Probably the first visitor to sight Machias, which for a long time was the commercial center of that remote district, was Champlain, in 1604.[1] A little later in the same century Isaac Allerton, one of the Pilgrims and a prominent man in Plymouth, Massachusetts,[2] and Richard Vines, of Saco, Maine, sent their ships to that point to traffic with the natives and to establish a trading post. The post was taken from the English in 1633 by order of Governor La Tour, the French taking both houses and goods and killing two of Allerton's men who made resistance.[1] Eastern Maine grew slowly. The French claims had shut out all settlement east of Pemaquid, which is about midway between the mouth of the Kennebec and Penobscot Bay, that part remaining a sort of neutral ground.[2] Machias was an important station under the French in 1639 by the name of Majois, when Antoine de la Mothe Cadillac held sway in Acadia.[1]

In 1688 an account was taken of the inhabitants scattered along the coast between the Penobscot and the St. Croix, under the direction of Governor Andros. At this time there were only forty-five Europeans settled between those two rivers. The inhabitants, in 1704, were all captured by the celebrated Captain Church, on his fifth expedition eastward against the French and Indians, and their settlements and habitations were broken up. From that time until 1761 there was little of

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1 "Centennial Anniversary of the Settlement of Machias," May 20, 1863.
2 "The Making of New England," S. A. Drake, 1886.

interest in the development of that portion of Maine. That year, however, was one of extraordinary drouth and scarcity throughout that part of Maine lying west of the Kennebec River, and was preceded by wasting sickness that added greatly to the calamities of the people. "These severe calamities were followed by devouring fires which did immense damage. They burst from the woods of New Hampshire early in July of this year (1761), and, burning with irresistible fury, passed through Lebanon, in Maine, and, being driven by the wind to the eastward, entered Scarborough, Gorham and other towns and ravaged the neighboring forests until they were checked by a flood of rain which fell on the 19th and 20th of August."[3] These fires are treated more in detail in the previous chapter.

The following interesting excerpt concerning the settlement of Machias and the development of the lumber industry at that place is taken from the report of the centennial anniversary of the settlement of Machias, May 20, 1863:

The year 1762, also, was equally distinguished with its predecessor for an extraordinary drouth and terrible fires. Early in the year six dwelling houses, two sawmills and several barns were burned in Scarborough; six families were burned out in Yarmouth, and in every direction extensive fields were destroyed by the flames and laid open by the destruction of the fences. Even the cattle did not escape the violence of the devouring fire. A prodigious quantity of most valuable forest timber was also destroyed, and so much were the crops cut short that greater supplies than usual were necessarily imported for the people's support. . . .

[In the autumn of 1762 an expedition, consisting of the settlers from Black Point and Scarborough, was made to the extensive marshes on rivers east of the Penobscot to obtain hay.] Another object also was to explore the places they visited for the purpose of setting up a lumbering establishment. For the fires before alluded to had destroyed a great portion of the pine timber lands in the vicinity of Scarborough, and, being in the habit of lumbering more or less every year, they [the settlers above referred to] were not disposed to overlook the advantages which a new country might afford for this purpose. Our little exploring expedition, in their progress eastward, at length arrived at Machias,where they found hundreds of acres of marsh, covered with, to them, invaluable grass. . . . And here, too, their keen, practical observation discovered a wilderness of untouched pine timber forests, overhanging a water power of almost unlimited extent, unoccupied, and at the head of tide water navigation. . . . On their return the story of their voyage, and of the discovery they had made, was soon told. . . . Not a few of the inhabitants . . . listened with eagerness to accounts of a more favored location—of a spot where the lumberman and the husbandman could find resources of wealth so abundant. And an association of sixteen persons was accordingly formed during the ensuing winter of 1763, for the purpose of building a double sawmill at Machias, to be owned in as many shares—and it was determined to commence operations the following spring.

. . . Their passage to Machias was long and stormy. . . . On the 20th of May the vessel arrived in Machias, anchoring first at the Rim. . . . They made a temporary shelter with a few boards, lodged against a birch tree which had been partly

[3] "Centennial Anniversary of the Settlement of Machias," May 20, 1863.

broken down. . . . The passengers remained on board for several days, until a clearing was made and a double log house built, where Front Street now runs, in front of the old Inglee house. Mr. Larrabee, wife and children, occupied the other part, the men employed in building the mill boarding with them.[4]

The mill—which was a double mill, and situated on the same site where the present mill Phoenix now stands on the northern shore—was completed with all the despatch practicable under the circumstances of a new settlement. It was not, we presume, finished with that skill and neatness which characterizes more modern establishments of the kind; but it nevertheless rendered essential service to the company; and before the season had closed, there were boards enough sawed to cover the log houses which were temporarily built for the accommodation of the eleven who had wives. Nine of the eleven—Larrabee and Berry having brought theirs at the commencement—removed their families from Scarborough in August. They were brought in a vessel commanded by Captain Joseph Wallace. . . . He took with him a supply of provisions with the intention of bartering them for lumber; but when he arrived at Machias but few boards had been manufactured, except enough to supply the wants of the settlers, whom he found in a measure destitute. Captain Wallace, having sold his provisions and other articles to them, they engaged to furnish a cargo on his return the next spring, which was done.

During the year 1764, the inhabitants manufactured nearly 1,600,000 feet of lumber —which must be considered for those times an extraordinary season's work. To be sure, the people at that time had no great difficulty in procuring logs for their mill, and at something of a saving, too, as to timber rent, but it is rather surprising to learn that the timber which grew on the northern end of the "seven-acre" lots, so called, should have been hauled to the Middle River stream and rafted round to the mills, when, by hauling them scarce half a mile, they could have been brought to the mill pond.

The mill was divided, according to agreement, into sixteen shares. There was also a division made this year of the mill or seven-acre lots, so called. These, as is generally known, lie on the peninsula between the marsh on the south side of the Middle River stream, and the north side of the river on which the mills are built. They are seven rods in width, running nearly across the peninsula. Of these lots there were eighteen, laid out by the mariner's compass. Sixteen of them belonged to the several original partners of the company. . . .

During the year 1765, our little colony increased in considerable numbers, with every sign of future and long-continued prosperity. A reputation had gone abroad most favorable to its resources. Many persons came this year, and took up farm lots as well as engaged in the lumbering business. .

In the spring of the same year (1765) the O'Briens, Elliott, Holmes, Underwood, and . . . two Libbys . . . commenced a double sawmill on the south side of the river, on the same site where the present Dublin mill now stands; but it was not finally completed until the ensuing March. . . .

Some time in the summer of this year Captain Ichabod Jones, . . . then living in Boston, . . . heard of the settlement at Machias—that much lumber was made there, and he proceeded thither immediately. Here he disposed of his goods, loaded his vessel with lumber, and came to Machias again with additional supplies. On this second trip he was invited . . . to unite . . . in building a double sawmill on the west bank of that river. Captain Jones agreed to join them and build one-quarter. They accordingly got out a frame and set it up the same fall.

[4] Judah Chandler, who arrived at Jonesboro, which joins Machias on the west, about 1763-4, is supposed to have been the first settler there. He built his house and mills in 1764.—"History and Description of New England," Coolidge and Mansfield, 1859.

This mill was situated on the same site where the sawmill Unity, supposed to have been named after one of Ichabod Jones' vessels, now stands on East Machias River, just below the bridge on the west side. Captain Jones made another trip the same season, bringing further supplies for his partners and others.

In 1766, most of those who built the first mill—part of the company of the original sixteen—took up farm lots also. . . .

In 1768 Captain Jones, Jonathan Longfellow, Archelaus Hammond, Nathan Longfellow, Amos Boynton, John Underwood and some others built a double sawmill on the island in the Falls, where the Rock mill now stands. A single sawmill was also built the same year by Joseph Getchell and others who lived on the north side of Middle River, at the outlet of the pond now known as Bowker's Lake. Jonathan Longfellow was this year appointed a justice of the peace, being the first civil officer commissioned east of the Penobscot River. . . . The inhabitants at the close of this year, 1769, again petitioned [they had, in 1766, petitioned for a grant of a township of land including their settlement, but failed to get it] the General Court of Massachusetts for a grant of a township of land. . . . [The General Court granted the petition upon certain conditions, which referred to settlement and cultivation.]

The last condition is, that "as the township is remote from the centre of the province, and at a great distance from His Majesty's surveyor of the woods and timber, the Petitioners were required to take especial care not to destroy or cut any of His Majesty's timber on or about said township."

The conditions of this grant were the same, or nearly so, under which most of the grants for forty years previous had been made.

The provision, restricting the cutting of His Majesty's timber on the township, refers to a condition in the provincial charter that all trees of twenty-one inches in diameter, upwards of twelve inches from the ground, were to be reserved for masts for the Royal navy—and a fine of £100 was incurred for every such tree cut down without a license first had and obtained of the King's surveyor.

A double sawmill was built this year [1770] by Ichabod Jones, Jonathan Longfellow, and David Gardner, a Quaker from Nantucket, near the outlet of Gardner's Lake and Gardner's Stream.

Seven years had now elapsed since the commencement of the enterprise to establish a permanent settlement at this place. . . . Three double sawmills had been built on the "Kwapskitchwock" Falls, a single sawmill at Middle River, a double sawmill at East Falls and another double mill at Gardner's Lake. . . .

The *Bangor Historical Magazine* gives the following record of the early Machias mills:

MACHIAS MILLS.

In 1764 the sixteen Associates in sixteen shares erected a double mill and laid out land contiguous into seven-acre lots.

In 1765 Morris O'Brien and sons erected a sawmill on the south side of the falls, Western River, which was called the Dublin mill.

In 1765 Col. Benjamin Foster, Wooden Foster, Samuel Scott, Daniel Fogg, Joseph Munson and Joseph Sevey built a mill on Eastern River, one-quarter of which they sold to Ichabod Jones.

In 1768 Ichabod Jones, Jonathan Longfellow, Archelaus Hammond, Nathan Longfellow, Amos Boynton, John Underwood and others built a double sawmill on the island and falls on Western River.

In 1767, April 20, Aaron Hanscom sold to Nathan Longfellow and others on ye

middle of ye Falls of Western River in Machias between old sawmill and Dublin sawmill.

In 1768 Joseph Getchell and others built a sawmill on Middle River at outlet of Bunker's or Barker's Lake.

1770 Ichabod Jones, Jonathan Longfellow and David Gardener built a double sawmill at outlet of Gardener's Lake.

1771, September 30, Morris O'Brien sold his share in Machias sawmill to Gideon O'Brien for £100.

1771, September 11, Stephen Young sold Nathaniel Sinclair one-sixteenth part of the sawmill on Middle River, Machias, known by the name of the "Merry Meeting Mill."

In 1771, September 11, John Berry sold for £12 one-sixteenth and one-half of one-sixteenth of the sawmill.

1772, May 28, Jonathan Woodruff sold Stephen Smith one-sixteenth part of the northwest side of the Rock mill on Western Falls River for £13 6s 8d.

June 24, 1772, Joseph Holmes sold Ichabod Jones one-twelfth of the double sawmill Unity at Western Falls, standing on the island, bounded by an old mill pond on one side and the river on the other. Also one-sixth part of the single sawmill on south side of said falls, built . . . in company with Morris O'Brien, John Underwood and others in 1765 for £58 13s 4d.

April 27, 1773, Daniel Hill sold Ichabod Jones one-sixth of the first single sawmill built on the western side of the Western Falls.

May 14, 1773, Samuel Libby sold Ichabod Jones one-sixteenth part of the double sawmill Unity, more commonly called the Rock mill, on the island at Western River, for £27 14s.

May 22, 1773, James Elliott mortgaged to (Jones) two-eighths of the stream saw called the Dublin mill, so called, on Western River, Machias, said two-eighths of the said saw being two-sixteenths of the said mill.

In 1777 the British burned a tide mill and grist mill at Butterfield's Creek.

The following is an extract from a "Memorial of the inhabitants of Machias, asking an abatement of the state taxes, presented in 1787," to the Senate and House of Representatives of Massachusetts, and is taken from the "Centennial Anniversary of the Settlement of Machias:"

When peace took place in 1783 and goods could be obtained for lumber, they [the people of Machias] were under the necessity of obtaining considerable credit in order to carry on their business & clothe their families. The Mills during the war went to decay & were rotting down, but lumber being now in great demand & commanding a greater price they excited to rebuild their Mills but were at a very great expense in doing it as lumber of all kinds were exceeding high. We had just got under way & a prospect of discharging the demands against them when the navigation act was passed, which immediately knocked the price of lumber down from 8 to 4 dollars per thousand, and is now a drag at 3 dollars. Thus were the people involved in the utmost distress for most of them were in debt at the commencement of war, and during the contest, had no means of discharging it even with paper money which they would not have wished to have done had it been in their power, and to those old debts they had under the necessity as before mentioned of adding a very considerable new debt, and the navigation act was followed by two exceeding dry seasons especially the last, when the drouth set in very severe in July. The Mills soon were stopped for want of water, and continued so the remaining part of the season, & winter set in very early without rain.

As early as 1813 such proportions had the lumber industry of Machias attained that the exhaustion of timber supplies was predicted. At the centennial anniversary of the settlement of Machias, in 1863, the Hon. J. A. Lowell said:

More than fifty years ago an elder brother of mine, now deceased, visited Machias. . . I recollect that, in his letters to my father, he gave an interesting description of the town and its people. Among other things, he described your unrivaled water power, your mill sites and sawmills, and your noble forests of pine, spruce, juniper and hardwood, and expressed the opinion that all the trees suitable for sawed lumber would soon be cut off, and the people would then be obliged to turn their attention to farming, to the fisheries, and to shipbuilding.

One entire generation has since passed away. The lumbermen have continued to pursue their vocation. The mills have been kept constantly in operation. New mills have been erected. Gangs have succeeded single saws. The quantity of manufactured lumber has annually increased. But all the trees of the forest have not yet been cut off; nor have the people given more attention to farming or to the fisheries. They have, however, engaged extensively in shipbuilding, and that has become an important branch of their industrial pursuits.

THE MACHIAS RIVER.

The following shows the manufacture of lumber on the Machias River in 1874 and 1875:

LUMBER MANUFACTURED ON THE MACHIAS.

	1874. Long lumber.	1875. Long. lumber.
Perry & Holway	2,573,000	2,650,000
Pope Bros.	5,900,000	5,800,000
Holway & Donworth	2,549,000	2,895,000
A. Hemenway	4,000,000	3,600,000
Vose & Talbot	2,700,000	2,700,000
W. C. Holway	465,000	400,000
Total	18,187,000	18,045,000

The manufacture of lath by the same operators was 17,800,000 in 1875, against 18,200,000 in 1874.

WHITNEYVILLE.

	1874.	1875.
Pope Bros. (two mills)	2,573,000	2,729,000
Sullivan & Pope Bros.	2,000,000	2,200,000
Total	4,573,000	4,929,000

The amount of lumber manufactured on the Machias River in 1877 was 13,056,000 feet, against 14,405,000 in 1876 and 18,045,000 in 1875. Of this amount A. Hemenway sawed 4,774,000; Pope Bros. 3,144,000 and Vose & Talbot 2,177,000. Pope Bros. manufactured also 1,285,000 at Whitneyville.

The Machias River cut in the season of 1902-3 was 14,000,000 feet, of which about 6,000,000 feet was hemlock, 5,000,000 spruce and 3,000,000 pine. The Machias Lumber Company cut about 9,000,000 feet, Cornelius Sullivan, of Whitneyville, 3,500,000 and various small operators 1,500,000. In times past as much as 40,000,000 feet of logs was cut annually on the Machias, and by far the greater part of the cut was pine, which was ex-

ported to the West Indies A few cargoes of pine still are sent occasionally to the same markets, but the big timber of the flush times has long since disappeared and the trade will never again be of much importance.

MAINE'S FOREST WEALTH.

Some idea of the true value of timber lands and nature's power of reproduction in filling the gaps made by the woodsman's ax can be had by a rough estimate of the timber cut and manufactured on Machias River since the settlement by the party from Scarboro in 1763. In that year, as has been stated before, a double sawmill was built and lumber sufficient for local demands was manufactured that fall; in 1764 1,600,000 feet was manufactured, and by 1768 four double sawmills and a single sawmill were completed. These mills were capable of cutting at least 5,000,000 feet annually.

To be conservative and suppose this to be the limit for the next sixty years, the total cut would have then reached 300,000,000 feet. Soon after 1828 additional mills were built at Machias, and the annual cut increased to about 35,000,000 feet. A mill was built at Whitneyville, three miles farther up the river, in which about 11,000,000 feet annually was cut, making a total cut at Machias and Whitneyville during the next fifty years, to 1878, of 2,300,000,000 feet, or a total to that date on the river of 2,600,000,000 feet.

Then came a falling off in the lumber business, from 1878 to the present time, only about 16,000,000 feet being now manufactured on the river. To suppose this to have been the annual cut for those twenty-seven years from 1878 to 1905 gives 432,000,000 feet, or a total cut of 3,032,000,000. The timber has decreased by fire and ax, yet the lands are held today at greater value than they were when the pioneer struck the first blow to down the first tree more than 140 years ago, and any time during those years. The total value at $10 a thousand feet would reach the substantial sum of $30,320,000.

MILLS IN WASHINGTON AND HANCOCK COUNTIES.

There were other scattering mills in Washington and Hancock counties at an early date. Abraham Somes went to Mt. Desert, Somes' Sound, in 1762, and about that time built a mill there. Judah Chandler and one Buckman built a mill on the north side of Chandler River in 1764. This mill was afterward rebuilt by Ephriam Whitney. Captain Ephriam Whitney built a mill known as the "Kennebec mill." There were other tide mills, also mills at Englishman's River and at Beaver Brook. John Buckman, from North Yarmouth, built mills at Columbia Falls in 1765, and Joseph Wilson, from Kittery, built a mill in 1765.[5]

Tristram and Richard Pinkham went from Booth Bay to Goulds-

[5] *Bangor Historical Magazine*, Vol. VI, 1891

borough, 1764-5, and built a tide mill at Long Cove, now Pinkham's Bay. These two men with their families removed to Steuben prior to 1769. They sold the mill to Jesse Fearson, of Boston; he to Paul D. Sargent, October 10, 1785; afterward the mill was sold to Joseph C. Wood, 1800, and his heirs sold to William Freeman, of Cherryfield.[6]

Alexander Campbell built mills at Tunk River, No. 7, east of Sullivan, about 1766-7, before he removed to Steuben, or Cherryfield.[6]

John Waite, Junior, of Falmouth, sold David Eades, of Winden, December 15, 1768, half of a double sawmill in Township No. 4, to the eastward of Union River.[6]

Colonel John Allan and Elijah Ayer commenced building a mill at Edmunds in 1787, but sold out to Col. Aaron Hobart, who completed it. Isaac Hobart built a mill at Little Falls in 1790.[6]

John Peters, in his survey of Mount Desert Island, 1789, says: "Now we begin a lot for James Richardson, beginning at a cove about eighty rods to the eastward of an old mill dam formerly built by Governor Bernard." This is supposed to have been near the head of Somes' Sound.[6]

De Gregorie interested himself in building a mill near Hull's Cover, and in his deed to Henry Jackson, August 4, 1794, he surveyed "one square acre at the end of the mill dam and also the mill erected there."[6]

At Cooper General John Cooper built a sawmill in 1816, which he named the "Successful Enterprise," and a grist mill named the "Resolution," both costing over £2,000.[6]

THE UNION RIVER.

On the Union River operations are small, the territory from which the log supply is drawn being of very limited area, while close cutting and disastrous fires stripped much of the land years ago. It is not easy to locate the first mill on Union River. Benjamin and Thomas Milliken built a double sawmill, 1763-5 on the site where Black's mill stood in 1865. It is said by some that Benjamin Joy and Jonathan Fly were interested in this mill or another mill built about the same time. Another account says: "Samuel Milliken and others built a mill on Card's Brook, 1765, which was known as the 'Folly Mill.' Ben. Jellison, January 9, 1775, sells his interest in falls and dam on the 'middle dam.' Ivory Hovey had a mill in 1776."[6]

In 1781 Capt. Ben Gates bought a crank for his mill.[6]

In September, 1782, Ivory Hovey or Meletiah Jordan paid Thomas Wyer for carrying a raft of boards from Union River to Fort George, now Castine.[6]

In 1784 Jonas Shattuck, of Pepperell, one of Benedict Arnold's men, after losing a leg in service, built, in company with an older brother, a mill

[6] *Bangor Historical Magazine*, Vol. VI, 1891.

on Squam Island (Swans?), Maine. The mill was a rude affair and had a capacity of 500,000 feet a year. The sawmill was still being operated by the Heal brothers, grandchildren of Jonas Shattuck, in 1881, with an annual capacity of 4,000,000 feet.

The cut on Union River in the winter of 1901-2 was about 7,500,000 feet. Whitcomb, Haynes & Co. are the largest operators and manufacturers, sawing long lumber, shingles and lath, as well as a great many staves. In one season the firm's output of staves was 23,000,000, shipped chiefly to Rondout, New York, to be made into cement casks. The mills are at Ellsworth and vicinity. The Union River, while poor in spruce, has a great wealth of hardwoods, and the firm of Pierce & Watters, which owns several townships of birch, beech and maple, has developed an extensive business in the manufacture of staves and heading, much of its product being sold to the Standard Oil Company. Another hardwood industry has been organized at Ellsworth, where a corporation has leased a vacant shoe factory and equipped it with machinery for the manufacture of novelties such as are produced in large quantities in other parts of the State.

The history of Cherryfield contains one character of particular interest —Alexander Campbell, who moved to Steuben, now Cherryfield, before the Revolutionary War, where he built mills about 1772-3.[7]

"He first contemplated building a dam and mill on the privilege now occupied by the 'Forest Mill,' grist mill, etc. He took counsel of Mr. Ichabod Willey, who was the only wheelwright, and of others who had lived there some years, and they advised him to build a dam down at the point instead, for two very sufficient reasons in their estimation. 1. A sufficient head to work a mill could not be raised up at the falls, and 2d. there was little or no timber on the river above, and he would need to have his mill where he could reach it with logs cut upon the river below, and upon the island. There was already a mill on the dam now occupied by Coffin & Co., and that would more than use up the timber that could be got up river. And so he built a dam and a tide mill down below." There was a mill at Cherryfield prior to that built by Mr. Campbell, perhaps owned by Joseph Wallace, Deacon Jonathan Stevens and others.[7]

"Deacon Stevens settled near the head of the bay and owned a grist mill near where Mrs. Shaw lately lived. He was a pious man, and, having a natural gift for language, he used to conduct religious meetings and officiate at funerals. His grist mill was of rude construction, and some hours were required to convert a bushel of grain into meal, and as all the people for a long distance around depended upon his mill to grind their grain, he generally found it necessary to keep the old wheel in motion day

[7] *Bangor Historical Magazine*, Vol VI, 1891

and night, week day and Sunday. Nor did this interfere so much with his rest and devotions, as might seem probable. He used to fill the hopper and leave the gentle old mill to work away upon it while he took a long nap, or on Sundays went to the meeting, read a sermon and made a prayer." [8]

On the Narragaugus River the log cut averages about 7,000,000 feet, most of which is sawed at Cherryfield, where G. R. Campbell & Co., William M. Nash & Sons and E. K. Wilson have mills, the last named being engaged chiefly in the manufacture of boxes.

The St. Croix, which is for some distance the dividing line between Maine and New Brunswick, has long been the scene of important operations, and in the winter of 1901-2 the cut on that river amounted to 35,000,000 feet, including spruce, pine, cedar and hemlock. Formerly, the cut was as high as 75,000,000 feet, a large part of which was hemlock, but since the decay of the tanning industry in Maine there has been little demand for the bark, hence no considerable operations in hemlock.

FAR-FAMED CALAIS.

One of the most eastern of the lumber district centers is about Calais, which stands at the head of tide water on the St. Croix River. That region was once surrounded by a great wilderness and in the middle part of the Nineteenth Century attracted the attention of lumbermen. Since that time, many millions of feet of timber have been cut in that district, one firm alone being credited with a cut of 42,000,000 feet in one season. Calais is accessible to ocean-going vessels and has been a great point for the shipment of lumber. The demand for lumber-carrying craft resulted in the erection of numerous shipyards along the river.

Rev. I. C. Knowlton in his "Annals of Calais," published in 1875, gives the following history of the early sawmill operations at Calais:

> Tradition affirms that the first white inhabitants in Calais were William Swain, from Massachusetts, and David Farrel, from Ireland. They came previous to 1780, but how long before cannot now be ascertained. Mr. Swain's cabin was in Milltown near the old Kimball house and not far from the railroad station. It is said, though by many doubted, that he built the first sawmill on the river. The location of this mill is supposed to have been near Goose Rock, a few rods below the Calais end of the Milltown upper bridge. If such a structure was erected or attempted, it was burned before it went into operation; and during the last half century no trace of it has been visible. . . .
>
> The first permanent white resident of Calais was Daniel Hill. He came here from Jonesport in 1779. A report had been circulated in Machias and vicinity for several years, that near the head of the tide on the St. Croix there was an abundance of fine timber, fish and game, and that the river up to this point was navigable for large vessels. . . .
>
> Mr. Hill, piloted by an Indian, came through the woods to Calais. On arriving he perceived at once that the country was even better than the report indicated. . . .

[8] *Bangor Historical Magazine*, Vol. VI, 1891.

Other persons from Machias and vicinity, very soon after, either that year or the next, joined Mr. Hill and made the settlement a neighborhood. . . .

The rich forests lured the pale-face people to the St. Croix Valley. The noble trees have furnished the means of subsistence to nearly all the citizens of Calais and St. Stephen. But to render their huge trunks marketable, it was necessary to manufacture them into timber, deal, joist, boards and lath; and hence, sawmills were indispensable. These facts were perceived and acted upon at an early date.

About 1780 Daniel Hill, Jermiah Frost and Jacob Libbey built a small, rude mill. It stood on Porter's Stream, near its mouth, and was the first mill ever erected in this vicinity. The number of men at the "raising" was so small that the ladies were obliged to lend all their strength in lifting the heavy timbers. Without their aid the frame could not have been set up. This was the first sawmill. It was supplied with logs from trees growing near the streams, cut and rolled in without the aid of a team. Here the first boards were sawed, and here the great business of the place began.

About 1785 William Moore built a sawmill and grist mill in the parish of St. David at the place ever since called "Moore's Mills." These mills, often rebuilt and repraired [repaired] are still running, and partly owned by his thrifty descendants. . . .

In 1789 or 90 Henry Goldsmith erected a grist mill and sawmill on the Waaweig River; and thither the farmers of St. Stephen and St. George [N. B.] carried their grain.

Not long after, Daniel Hill's mill having been swept away by a great freshet, another mill was erected by Peter Cristie, Joseph Porter, and others on the same stream and near the site of the first one. This was run profitably for many years.

The first mill on the main river was built at Milltown, about the beginning of the present century [Nineteenth], by Abner Hill, Peter Cristie and others. On its completion it was found to go so swiftly and strongly that it was christened the "Brisk Mill." It stood on the American side of the river; and a mill bearing the same name still saws briskly on the old site. The Washington mills were built soon after, on the same dam. In 1805 a mill was erected at Baring, by Daniel Rhodes and Maltiah Lane, for William Vance, Esq.; and soon after, other mills were built at such places on the river as seemed most convenient for the lumberman.

These mills run well, and it was easy to procure logs for them; but it was very difficult to get the manufactured lumber to tide water. Rafts could not be run down Salmon Falls without breaking and the roads in summer were almost impassable for a loaded team. In this emergency a sluice from the mills to the head of the tide was suggested, and about 1805, after much talk and correspondence, Margaret and Susanna Campbell, of Scotland, furnished the money, and the sluice was built for them on the St. Stephen side of the river. It proved so useful and profitable that it has been kept in operation ever since. It remained the property of the Campbells until five or six years ago, when it was sold at auction in St. Andrews, and bought for a few hundred dollars by C. F. Todd & the Eaton Bros., by whom it is still owned.

About the same time, i. e. 1805, a board sluice was also built on the American side of the river, from Milltown to Middle Landing. It worked well and was much used until the Union mills were built, when, lacking a convenient place to discharge its freight, it ceased to be used.

In 1824, Capt. Seth Emerson and Anaziah Nash built a sawmill and grist mill for Green and Shaw, at Ferry Point Rapids, near the site of Samuel Rideout's grist mill. These mills for a long time were valuable property.

In 1826 and 7, Capt. Emerson built for Joseph Whiting, A. Pond, Jones, Pike, and Whipple, at Middle Landing, now Union Village, the Lafayette mills. They went into operation in the spring of 1827.

Coolidge and Mansfield in their "History and Description of New England," 1859, give the following history of Calais:

> Calais, a port of entry and embraced in the Passamaquoddy district, is situated at the eastern extremity of Washington County at the head of the tide waters of the St. Croix. It contains an area of 19,392 acres and was granted by the State of Massachusetts June 27, 1789, to Waterman Thomas. Having an advantageous location for navigation, and being surrounded by dense forests of valuable pine timber, it soon became the mart for the lumber business, a great many persons being attracted here under the supposition that fortunes could be made. Ship timber was manufactured among the other varieties; and, when Napoleon excluded the English from the Baltic, they resorted to Calais to obtain the supplies necessary for their shipyard; hence a large and lucrative trade, which lasted for some years, was carried on between the inhabitants of this town and the British timber dealers. In 1809 Calais became an incorporated town. . . .
>
> Abner Hill, Peter Christie and others built a mill at Milltown in 1800. The Washington mills were soon after built on the same dam. In 1806 William Vance built a mill at Baring.

The same authority thus describes the conditions in the Calais district as they were in 1859:

> . . . A railroad has been completed to the mills at Baring, by which the large amount of lumber cut there is transported to Calais and shipped to the various markets. . . . Lumbering has ever been and still is the leading pursuit, and, as a consequence, a great amount of capital is invested in the trade. There are eight single sawmills, ten gang sawmills, eighteen lath mills, besides clapboard and shingle machines in active operation. All the lumber from the Baring mills is taken by the cars to tide water at Calais—there being four or five trains employed in the service each day, each train carrying some fifty thousand feet of lumber. The conveniences for manufacturing and conveying the lumber to the wharves are very complete—it being run directly from the mills on to the cars, where it is not disturbed until piled on the wharves ready for shipment.

Calais in 1857 manufactured 65,000,000 feet, of which one-half found a foreign market. The manufacture in 1876 was but 54,000,000 feet, two-thirds of which was spruce and hemlock.

Prominent in the development of Calais were H. F. Eaton, John Murchie and other early lumbermen. The firm of H. F. Eaton & Sons has a commercial history which runs back many years. Henry Franklin Eaton engaged in the lumber business in the St. Croix region in 1833, his brother, Joseph Emerson Eaton, being already a St. Croix lumberman. H. F. Eaton became the owner of a large sawmill at Calais and pine timber lands in the counties of Washington, Somerset, Piscataquis and Aroostook, Maine, and Charlotte, New Brunswick. When his two sons came into the business the name was changed to H. F. Eaton & Sons.

The lumber shipments from the port of Calais in the first five years of the decade from 1870 to 1880 were as follows:

LUMBER SHIPPED FROM CALAIS.

Year.	Feet b. m.
1871	100,000,000
1872	92,000,000
1873	82,000,000
1874	78,000,000
1875	61,000,000

The report for 1876 shows the exports from that port to domestic markets to have been as follows:

DOMESTIC EXPORTS FROM CALAIS.

Lumber, feet b. m.	54,064,482
Lath, pieces	49,138,900
Pickets, pieces	457,430
Knees, pieces	13,947
Cedar posts, pieces	5,144
Spruce poles, pieces	2,670
Clapboards, pieces	110,000
Spool stuff, feet b. m.	278,000

There was also shipped from Calais to foreign markets 6,602,000 feet of lumber.

The industry did not show any particular diminution in succeeding years.

In 1886 the shipments from Calais were 60,600,000 feet.

Rev. I. C. Knowlton in his "Annals of Calais," above quoted, enumerates the mills at Baring in 1875 as follows: "There are now in Baring eight gangs, two mules or muleys (single saws that move very rapidly), four shingle and six lath machines; in Milltown seventeen gangs, two muleys, nine lath, and two shingle machines; all in active and profitable motion, except during the winter."

THE AROOSTOOK COUNTRY.

In 1878 a writer, noting the passing of the pine of Maine, said:

A generation ago Aroostook County was known only for its shingles, rived and shaved by hand, from the vast forests of cedar. The stumpage didn't cost anything, for the shingle-makers stole it, and by hard work they could earn fifty cents a day. The shingles were carried by team to Bangor. It was a hard journey of twelve days for a loaded six-horse team through the wilderness of Presque Isle to Bangor and back. The shingles brought $1.75 to $2 per thousand. It is estimated that 75,000,000 shingles per annum were made by hand in the St. John and Aroostook valleys at that time. The product is now immense, but nearly all the shingles are made by steam or water power saws. Mills are scattered all over the country. Cedar is as plenty in Aroostook as bristles on a hog's back. They use big cedar logs for fencing pastures, and pile them three or four feet high at that. "Rift" is the term applied to sections of cedar four feet and an inch long. You see stacks of rift on every road, and the fences of cedar logs are endless. Over 100,000,000 cedar shingles will be sawed within the limits of Aroostook County this year. A few will be got out by hand. Good sawed cedar shingles fetch from $2 to $3.25 per thousand at Presque Isle. Hand shaved shingles are worth $1 more, in the market. All the shingles are eagerly bought by agents of Boston and New York firms. The shingle product of Aroostook amounts to over $500,000 per annum. The cedar forests have been the banks of Aroostook, and the shingles have been its currency. Many an Aroostook pioneer, without the ready cash, has paid for his cup of tea, his wife's gown, or even his family newspaper, in shingles.

In what may be termed generally the Aroostook country the lumber

industry has made rapid growth in the last few years, largely by reason of railroad construction, which affords an outlet for timber products by a direct route to American markets, while formerly all logs, save the comparatively small quantity manufactured at Aroostook County towns, were driven down the St. John River to be manufactured in New Brunswick. In the season of 1902-3 the Aroostook country cut amounted to 125,000,000 feet, including logs cut on the Allaguash and upper St. John. More than one-half of the cut was driven down the St. John into New Brunswick, but the proportion thus disposed of is growing smaller each year and soon the great bulk of logs cut in the vicinity will be manufactured, transported and marketed on American soil. The Fish River Railroad, an extension of the Bangor & Aroostook, extends from Ashland to Fort Kent and traverses one of the richest timber regions in New England. Mills are numerous along the line of the new road and extensive logging and manufacturing operations are carried on.

A very considerable part of Aroostook's logs are cedar and pine for shingles, the Van Buren Shingle Company alone having cut 10,000,000 feet in the 1901-2 season for the supply of its mills at Van Buren. Aroostook shingles are known all over the New England states and beyond as of fine quality; and, as the supply of cedar is very large, the industry is likely to continue indefinitely and with increasing success, owing to improved transportation facilities. One of the finest spruce mills in the country is that of the Ashland Manufacturing Company, at Ashland, on the line of the Bangor & Aroostook Railroad. This plant, which is owned by Bangor men, saws about 35,000,000 feet of long lumber yearly, all of which is shipped to Bangor by rail, where about eighty-five percent of it is loaded into vessels for coastwise ports. The Ashland company cuts its own logs, employing about four hundred men in the woods, and all these logs are taken from a region which formerly had no other outlet than the St. John River. About three hundred men are employed in the mill and on the company's wharves at Bangor.

Among the more recent enterprises in the development of the Aroostook County region, which has been going on rapidly for several years, is the St. John Lumber Company, with mills located at Van Buren on the St. John River, in the northeast corner of Aroostook County. This is a double band mill cutting 120,000 feet of spruce lumber a day, 80,000 lath, 150,000 to 175,000 shingles and also clapboards. This company has an ample supply of timber. Its president is Charles A. Milliken, of Augusta; treasurer, J. W. Parker, of Portland, with A. W. Brown assistant treasurer and local manager. J. W. Parker, spoken of above, was at one time with the Berlin Mills Company, but sold his interest in that company in 1896. Prior to that time he had bought the plant of the South Gardiner Lumber

Company, at South Gardiner, with a sawmill equipped with circular and band. The timber was secured on the Kennebec. In 1896 he purchased control of the Rufus Deering Company, of Portland, lumber wholesalers and shippers.

Besides the mills located on the rivers there are countless others, large and small, along the lines of the railroads, devoted chiefly to sawing spruce, pine box boards and short lumber. A sawmill of some kind or size is almost certain to be found wherever there is a convenient supply of timber and a chance to get the product to market.

Sawmills "sprout" in Maine, so to speak, and it is as natural for the up-country people to haul and saw logs as it is for the coast people to build and sail vessels.

For nearly forty years a few American firms and individuals have been cutting logs along the headwaters of the St. John and its tributaries in northern Maine and driving them down to Fredericton and St. John, New Brunswick, sawing them into lumber at those places and then shipping the product into United States markets free of duty, under an act of Congress passed in 1867 and since then incorporated in every tariff act. This act provides that logs cut on American soil, owned by American citizens and manufactured by American citizens in the Province of New Brunswick, shall be admitted to American ports free of duty and the law was enacted to meet conditions existing at the time, there being then no other means of getting that timber to market.

This industry is of great importance, the American logs thus driven down the St. John and manufactured on foreign soil for free shipment to American markets constituting about two-thirds of the entire lumber business of the St. John River. No objection was made to the arrangement described until recent years, when, a railroad having been built into Aroostook County and the lumber of that region furnished with a new and direct outlet to home markets over American soil, other Americans went up the St. John River and erected large sawmills at and near Van Buren. It soon became evident to the Americans operating mills at St. John and Fredericton that, unless something were done to check the growth of the lumber manufacturing industry on the upper St. John, their long-enjoyed monopoly must come to an end, and so, through Canadian official channels, they made strenuous objection to the building of piers and booms by the upriver men for the purpose of catching and holding logs for the Van Buren mills.

It was claimed that the piers and booms which the Van Buren manufacturers asked permission to construct would constitute an obstruction of the St. John River, in violation of the so-called Ashburton Treaty. This action by the American manufacturers in New Brunswick aroused

the wrath of the upriver men, who declared that they have a right to use the river at least as far as the middle of the channel; and that, so far as violation of any treaty is concerned, it is the downriver men who are guilty, as their log drives frequently obstruct the entire river for months at a time to such an extent as to shut out all others. In retaliation for the hostility of the downriver manufacturers, the upriver men endeavored to secure the repeal by Congress of the act of 1867, contending that the occasion for such legislation no longer exists—that, a means of transportation being now open over American soil for the product of the northern Maine forests, the logs should be manufactured at home and no longer sent to foreign mills, to be manufactured by foreign labor and thence transported in foreign vessels to our markets, to the great injury of Maine and the corresponding advantage of the Province of New Brunswick.

CHAPTER VII.

MAINE—SPRUCE AND HARDWOODS.

Upon no subject have statisticians disagreed more decidedly than in their estimates of the amount of spruce standing in Maine and the length of time that it will last. Longer ago than the oldest inhabitant can remember there were people who could prove to a mathematical certainty that the supply of spruce, and of every other timber for that matter, would end in a few years, and in every year since there have been prophets of timber exhaustion who have talked and written at great length to show that "at the present rate of cutting" Maine would soon be as bare of trees as are the prairies of the West. Most of the prophets have died leaving a well-wooded State behind them, but their successors are with us and the present generation of prophets is far better equipped than were its predecessors with theories, all capable of mathematical demonstration, that the spruce supply of Maine will last only about so many years.

To show how long ago these apprehensions concerning the timber supply of the State existed, the following quotation is made from a little volume entitled, "The Maine Reference Book," published by a Boston firm in 1844. This book says, in the course of a brief chapter on the lumber industry of Maine:

"Timber of the first quality is becoming scarce on the Penobscot waters; and the timber on the Allaguash is increasing in value, as it finds its way to market on the Penobscot, in preference to the long and uncertain transportation of the St. John. The construction of a dam fifteen miles below Chamberlain (Lake), so as to float the timber above into the Penobscot, will connect a large tract of valuable timber land with this market."

Since "The Maine Reference Book" gave utterance to this note of alarm there has been cut on the Penobscot River about 9,000,000,000 feet of timber and loggers seem to have no trouble in finding 200,000,000 feet every winter now. It is true that the big "pumpkin pine" that used to grow almost within sight of the church steeples of Bangor has disappeared —but so have the Indians who used to come down from Oldtown in their canoes and promenade the streets in light and airy attire of blankets and paint. There are only a few Indians now, and when they come to Bangor they travel by rail—but there are more white people. There is not much big pine close by now, but there is a great plenty of spruce up north, and, like the Indians, a good deal of it comes by rail.

A man, familiar with the lumber industry and the forestry conditions of Maine, in discussing the question of spruce supply, said:

In the report of the forestry commissioner we find an estimate of the quantity of spruce timber, of suitable size for cutting, standing in the Androscoggin Valley. The estimate is about 3,600,000,000 feet on 1,240 square miles. The spruce-producing area of the Kennebec Valley is about 2,800 square miles; of the Penobscot Valley, 4,500 square miles, and of the St. John Valley in Maine, about 5,000 square miles. If we apply the estimates of the Androscoggin spruce-bearing section pro rata to these three sections we shall have the enormous amount of 35,424,000,000 feet of spruce in the Kennebec, Penobscot and St. John valleys. But this amount probably should be reduced one-third, as the three sections under consideration are not considered equal to the Androscoggin Valley in spruce production. Reducing the amount as suggested, and adding the estimated amount of spruce in the Androscoggin Valley, we have 27,024,000,000 feet of available spruce in the four great spruce-producing valleys of the State.

In an address delivered in Boston, in 1902, before the Association of Engineering Societies, on "Forest Management in Maine," Austin Cary estimated the amount of spruce standing in Maine at the time at approximately 25,000,000,000 feet board measure. Assuming that the yearly demand from the lumber and pulp mills will, for many years, be not far from 600,000,000 feet, it will take a period of more than forty years to cut over the whole spruce-producing section, a period sufficiently long to grow spruce from twelve to eighteen inches in diameter breast-high. In the opinion of practical lumbermen, these estimates are entirely conservative.

One experienced lumberman gives it as his opinion that there is on an average 1,000 feet of available spruce for every acre of forest land in Maine. That would give about 13,500,000,000 feet, requiring twenty-two years to cut over; probably this is too low an estimate and the true amount lies somewhere between the two. Austin Cary said in a recent forestry report: "Taking the State as a whole, I doubt if the yearly production of spruce is overcut. A cut of 600,000,000 feet of spruce annually would be only thirty feet growth per acre on the gross area of the State, or perhaps sixty feet on what is actually spruce-bearing land." The actual growth per acre on much of the spruce-bearing land is over 100 feet per acre annually. We can safely assume that the yearly growth will average fifty feet for every acre of forest land. That would give more than 600,000,000 feet yearly, and it is the opinion of well-informed manufacturers and operators that this source of wealth can be maintained permanently in Maine.

There are dangers, however, that must be avoided. The reckless and unnecessary waste in leaving so much of the tree in the woods should cease at once, more care should be taken in yarding the logs and all unnecessary destruction of small trees should be avoided. Timber land owners should draw rigidly their contracts for selling stumpage and insist on the faithful carrying out of the terms of the contracts. If a broad-minded policy is adopted by timber land owners and a due regard for the future prosperity and welfare of the State prevails among them, the forest area of the State can be made to yield a perpetual revenue.

CONSERVATIVE CUTTING.

While the predictions as to the destruction of spruce have all proved to be wide of the mark, the constant sounding of alarms has had a good effect; for within the last few years there has been much investigation of forestry conditions, the supply of spruce and the relative proportions of

TYPICAL SPRUCE STAND, SQUAW MOUNTAIN TOWNSHIP, MOOSEHEAD LAKE, MAINE

growth and consumption. There is a vast supply of spruce, but the enlightened operator, land owner and manufacturer of this day proceed upon the thrifty theory that a surplus is easier to handle than a deficit, and are determined that the spruce shall not be dissipated as was the magnificent pine of past years. Some of the big pulp and lumber concerns employ skilled foresters and have adopted every enlightened method and precaution tending to husband the resources of their lands. Some operators will cut no tree of less than one foot in diameter breast-high—a rule that is likely to be generally adopted—and it is to be observed here that in these times there is practically no waste at the mills, every part of the log being utilized in some manner.

The lumberman and the pulp millman each accuses the other of wastefulness and wrong methods in cutting. It is claimed that while, actuated by evident self-interest, the pulp millman sometimes culls out the larger trees and leaves the smaller, this is true, as a rule, only of his operations in tracts remote from railroads and from whence the logs must be driven down stream to the place of manufacture. The small trees would yield logs too small to be successfully driven and so, in such localities, they are left to gain further growth; but where the timber is convenient to a railroad it is generally the practice of the pulp concerns, so the lumbermen assert, to strip the land bare, as any log, however small, will make good pulp material. The lumbermen have had their wasteful day, however, and, although they are getting to be more careful now, they are scarcely in a position to preach economy to others. Log economy has become, through changed conditions, a serious study with all concerned and there is no doubt that all will profit by its observance.

FOREST FIRES.

Forest fires have been a menace to the forests of Maine as they have been to other states, but legislation is endeavoring to reduce this danger. Edgar E. Ring, Maine's forest commissioner, in his fifth annual report stated that the loss by forest fires in 1904 was very small, few fires having occurred outside of Washington and Hancock counties, where the rainfall, heavy in all other sections, was comparatively light. In 1903, one of the driest years on record in Maine, disastrous fires raged in the lumber regions, no fewer than 355 fires having been reported. Even in 1903 Maine suffered less, in proportion to its wooded area, than most other states, and this was largely due to the law passed that year providing for a fire warden service, with an appropriation of $10,000 for each of the years 1903 and 1904 to pay these men and to defray other expenses of preventing and extinguishing fires.

Fires may devastate wide areas of the spruce, the burnt lands growing up to hardwoods, like white birch; and reckless, careless methods, or lack

of any method, in lumbering may squander the wealth that nature has provided, but under the control of intelligent men, who have an eye to the future, this most valuable of Maine's forest growths should survive in abundance through the ages, so long as the rains fall and the sun shines.

THE SPRUCE MARKET.

The history of the spruce market in the last thirty years is a story of ups and downs—violent fluctuations, big profits, fair profits and no profit at all, with frequent downright losses. In the early '70's on the Penobscot River good spruce logs were worth $11 to $12 a thousand. Business was brisk, except in the panic year of 1873, the survey at Bangor in one year exceeding 270,000,000 feet, and manufactured lumber brought good prices. From 1876—the year in which the Bangor survey fell to 115,000,000—to 1880 logs were cheap, going as low as $8, with $10 the best price offered for good spruce. In 1880 the price advanced to $10 and $12 and since that time the demand of the pulp mills has given stability to the market, with a constant upward tendency, until now good spruce sawlogs are worth $16. This price is based on the Bangor scale, under which is a large overrun—that is, a thousand feet of logs, Bangor scale, will saw out 1,200 to 1,300 feet of lumber. On other rivers, where the scale is closer, the price of logs is lower, nominally.

Generally speaking, the lumber industry in Maine has recently been prosperous. In Bangor early in 1906, on board the vessel, wide spruce randoms (ten and twelve inch, random lengths) were quoted at $18 to $19 a thousand, which was equal to $22 to $23 in New York, freights being $3 and other charges $1 to $1.50. Spruce dimension, f. o. b. Bangor, was quoted at $17 to $18, and yard orders—2x3, 2x4, etc.—$15 to $16. With the best logs at $16 and an overrun of about twenty-five percent, well situated and properly conducted mills ought to prosper.

A sawmill run in connection with a pulp mill has a great advantage over one conducted independently, having a profitable outlet for its waste while being able to utilize crooked or seamy logs unfit for lumber. Forest Commissioner Ring is optimistic regarding the future of both the pulp mills and the sawmills. He thinks there is room in Maine for both and that the two industries should go hand in hand. The pulp mill makes a market for logs not fit for lumber and for trees which, if not cut away, would retard the young growth. A poor log is worth more for pulp than it is for lumber, while a good log is worth more for lumber than it is for pulp. Between them the pulp mill and the sawmill can make the most economic use of the spruce resources of the State, using due care to insure a continuance of the supply.

MAINE'S PULP INDUSTRY.

The pulp industry, which has become so important a factor in all

questions affecting Maine's timber supply, has been developed almost entirely since the Civil War and largely since 1880, in which year the total capital invested in pulp and paper making in the State was less than $2,500,000, whereas in 1903 the investment was not less than $30,000,000. There were in 1903 in the State thirty pulp mills and twenty-eight paper mills, comprised in thirty-seven different plants, employing about 7,000 hands, with wages averaging $1.62 a day. These mills used about 300,000,000 feet of logs yearly, valued at $3,000,000, and the total product of pulp and paper was valued at, approximately, $20,000,000 annually.

The largest concerns are the Great Northern Paper Company, with mills at Millinockett and Madison; S. D. Warren & Co., Cumberland Mills; International Paper Company, Rumford Falls, Orono, Chisholm, Embden, Enfield, Jay Bridge, Livermore Falls and Riley; Hollingsworth & Whitney Company, Winslow and Gardiner; Orono Pulp & Paper Company, Orono; Eastern Manufacturing Company, South Brewer; Cushnoc Paper Company, Augusta; Katahdin Pulp & Paper Company, Lincoln; Penobscot Chemical Fibre Company, Great Works; Howland Falls Pulp Company, Howland; Somerset Fibre Company, Fairfield; Forest Paper Company, Yarmouthville.

The Great Northern and International companies own each more than 350,000 acres of timber lands and are constantly buying more. The plants at Millinockett, Madison and Rumford Falls are very extensive, that at Millinockett involving an investment of $4,000,000 and being the sole industry of a village of 2,300 people, created by this enterprise in the midst of a howling wilderness.

The *New York Commercial* of October 31, 1904, gave the following description of the paper and wood pulp industry of Maine in that period:

> The paper and wood pulp industry is one of the oldest in Maine manufacturing. The paper mills proper now number about twenty-five. They are located at Auburn, Augusta, East Poland, Cumberland Mills, Chisholm, Brunswick, Benton Falls, Belfast, Gardiner, Kennebunk, Lisbon Falls, Livermore Falls, Madison, Rumford Falls, Orono, Millinockett, Mechanic Falls, South Brewer, Winslow and South Windham. Their output comprises manilas, "news," leather-board, jute fiber and wood pulp board, book and "coated" stock, heavy, high-grade rolls and sheets, parchment, writing papers, wrappers, bag and sack stock, machine finished and super-calendar books, fine tub-sized writings and so on. The power employed is largely water, but steam and electricity are not uncommon nowadays, some of the plants combining the two latter and one or two of them using all three powers. Their combined capacity is close up to 2,900,000 pounds every twenty-four hours, the principal raw material used being spruce logs cut in the Maine forests or brought "over the line" from Canada. Among the most pretentious of these paper manufacturing plants is the mill at Millinockett, in Penobscot County, which is equipped with sixteen 1,500-pound engines, turns out "news" almost exclusively and has a twenty-four hour capacity of 500,000 pounds. The mill at Cumberland Mills, not far from Portland, has a daily capacity of 200,000 pounds and pays particular attention to book papers. The two plants at Rumford Falls—managed

by different corporations—have a combined capacity of 510,000 pounds every twenty-four hours. At Chisholm, in Franklin County—a town name that easily suggests a name prominent in "news" manufacture—the Otis mill, so-called, has an equipment that embraces sixteen heating and eight refining engines and can turn out 352,000 pounds per day.

Of the mills in Maine whose product is ground wood and chemical fiber there are thirty-three. In not a few instances they are comprised with the paper-mill plants above mentioned, but are operated separately, of course—as, for instance, the Cushnoc Paper Company, at Augusta, turns out manilas—its specialties being envelopes and bag papers—and also sulphite fiber (dry) and ground wood (dry), its two mills for the latter product being known as the "sulphite" mill and the Augusta "pulp" mill. These ground-wood and chemical-fiber mills in Maine are in Gardiner, Fairfield, Enfield, Cumberland Mills, Chisholm, Brunswick, Augusta, Great Works, Howland, Jay, Lincoln, Livermore Falls, Lisbon Falls, Madison, Skowhegan, Shawmut, Riley, Rumford Falls, Orono, Oldtown, Millinockett, Yarmouth, Winslow, South Gardiner, South Windham, South Brewer and Solon.

There are more than thirty-five pulp and paper establishments in Maine of which more than twenty-five are modern plants. In 1900 their total capital was $18,000,000 and they employed 300 salaried officials and 5,000 wage-earners. The value of their output was $13,223,275, of which $5,000,000 worth was print paper.

The International Paper Company, of New York, controls many of the principal plants, its most extensive enterprise being at Rumford Falls, Oxford County, on the Androscoggin River. This company was organized in 1898 with a capital of $25,000,000 in cumulative six percent preferred stock and $20,000,000 in common stock. It acquired the manufacturing plants, water power and lines of over thirty pulp and paper making companies, together with 900,000 acres of spruce forest in the United States and 2,500 square miles of timber limits in Quebec. These mills had a capacity of 2,000 tons of finished paper a day. A subsidiary concern is the Continental Paper Bag Company, turning out 13,000,000 paper bags a day.

Early in 1904 articles of incorporation were filed in the office of the Secretary of State for the incorporation of the Publishers' Paper Company, with a capital stock of $6,000,000. The directors were William A. Hall, of New York, president; James A. Burnet, of New York, treasurer; Frank B. Noyes, of *The Chicago Record-Herald*; Victor F. Lawson, of the Chicago *Daily News*, and Oakley Thorne, of the North American Trust Company, of New York. The purposes of the corporation, which were varied and extensive, were mainly to acquire the rights, assets, franchises and property of the Eastern Timber Company, of Bar Mills. The latter company was formed from the reorganization of the White Mountain Paper Company, which, in July, 1903, petitioned for a receiver in the United States courts, resulting in the sale of its property and rights. The

property included the foundations of one of the largest pulp mills in the world, at Portsmouth, New Hampshire, and mills and water privileges throughout western Maine and New Hampshire, principally along the Connecticut River. The North American Trust Company loaned large sums on the bonds and became a trustee. The Publishers' Paper Company includes many of the members of the American Newspaper Publishers' Association and the chief object is to furnish paper for the leading newspapers of the United States. A special act was passed in the legislature authorizing the transfer of the franchise of the Eastern Timber Company to the Publishers' Paper Company and giving valuable rights to the new corporation as to the development and extension of its water powers. The Publishers' Paper Company represents strong financial and manufacturing interests which intended to take over the large tract of woodland owned by the Eastern Timber Company in New Hampshire and Maine, to develop the water power along the Saco River and to complete the construction of a 350-ton a day mill at Portsmouth, New Hampshire, making it the largest single paper mill in the world. The company's water power along the Saco River aggregates 300,000-horse power available for the transmission of electrical power for the company's pulp mill and paper mill at Portsmouth. The timber lands in Maine and New Hampshire represent the holdings of George B. James and the New Hampshire Land Company, aggregating 300,000 acres.

THE HARDWOOD INDUSTRY OF MAINE.

An important feature of Maine lumbering concerning which comparatively little is known is the cutting and manufacture of white birch and beech. These woods do not appear in the statistics with the spruce, pine and hemlock, because the logs cannot be driven, and because, as a rule, the operations are spread over a wide range of territory and conducted by a great many individuals.

White birch is in greatest demand, and it is estimated that 70,000 cords, or 35,000,000 feet, of this timber is cut in Maine annually, the bulk of it generally being sawed into spool bars, although of late that industry has declined somewhat, owing to a falling off in the export trade. White birch is also used in large quantities for the manufacture of what are known as wood novelties—clothespins, kitchen ware, boxes for druggists' and confectioners' use, shoe pegs, toys, etc.—an industry which has in recent years assumed large proportions in Maine, factories being located in every part of the State where there is any considerable growth of birch, notably in Oxford, Franklin and Piscataquis counties. Fruit box shooks are manufactured chiefly from beech, which grows abundantly in northeastern Maine, and from 2,000,000 to 3,000,000 feet of rock maple is manufactured annually into last blocks. At Greenville, Shirley, Newport and

several other places hardwood veneers for car and carriage work are made and there are also several factories where cheap grades of furniture are turned out in the rough.

The white birch growth of Maine extends, generally speaking, in a broad belt across the State, following the highlands of Oxford, Franklin, Piscataquis and Penobscot counties and spreading away over northern Washington and southern Aroostook counties. No estimate has ever been made of the quantity of this timber standing, but the present stand and future growth doubtless will be sufficient to keep fully supplied for many years all the mills now in operation and that are likely to be established. White birch growth generally follows a fire among the spruce. It is estimated that a white birch requires fifty years to attain the size suitable for sawing into spool bars. After that age red heart, which is a sign of decay, develops, but the Perkins & Danforth Company, of Bangor, has been cutting birch estimated to be 110 years old, the growth having followed a great fire that swept through the spruce in that region in 1795. In the manufacture of spool bars all red heart must be eliminated, not only for the sake of appearances but because red heart will not turn smoothly, and in most operations from 20 to 33 percent of the timber is lost in culling. The manufacture of spool bars in Maine began about thirty years ago, encouraged by the Morrill tariff, which increased the duty on wound thread. Maine men saw in this schedule an opportunity to sell spool bars and finished spools and proceeded at once to develop the new industry.

THE SPOOL WOOD INDUSTRY.

The manufacture and export of spool wood is a business almost peculiar to Maine. Bangor is the center of the trade. The white birch must be absolutely clear and is cut into bars $\frac{1}{2}$ to $2\frac{9}{16}$ inches square, and $2\frac{1}{2}$, 3 or 4 feet long. The price alongside the vessel in Bangor was, in the earlier days of the industry, about $20 a thousand feet board measure, but it has advanced until it is now in the neighborhood of $28 with, it is claimed by the operators, less profit at the higher price than formerly at the lower one. The advance is due to the higher price of stumpage and the necessity of going farther back from the streams or railroads for the timber.

The birch is cut in winter and sawed out at small portable mills scattered along the lines of the railroads, about two and one-third cords of the wood being required for 1,000 feet of bars. After sawing the bars must be "stuck," or piled, criss-cross, in order to allow the free circulation of air, protected from the weather and thus left to season until June. Without thorough seasoning the bars would mold and turn black, which would render them unmerchantable. The spool bar manufacturers number about thirty and in ordinary years the product of the mills amounts to about

15,000,000 feet. Approximately, the same quantity of bars is turned into spools in the Maine factories. When normal conditions prevail in the market, manufacturers of spool bars receive $16 to $18 a thousand for their product.

Maine spool factories are now turning out about 800,000,000 spools annually, valued at nearly $1,000,000. The price varies from seven to sixty cents a gross, according to size and quality of the spools. The market is extensive, including most of the great thread-making concerns of New England and the middle states. Spool factories are located at Willimantic, Lake View and Foxcroft, in Piscataquis County; Phillips, Carrabassett and Farmington, Franklin County; Belgrade, Kennebec County; Lewiston, Androscoggin County; Kezar Falls, York County; Locke Mills, Bryant Pond, Bethel, Dixfield and South Waterford, Oxford County; South Lincoln, Penobscot County, and Wilton, Franklin County. About five hundred and fifty hands are employed and the wages paid average $1.50 a day, making a total of about $250,000 a year. Stumpage costs $1 a cord and the birch wood delivered at the factory is worth $4 a cord, at which rate the average yearly supply would cost $120,000. Besides the men employed in the factories, a considerable number are employed in the woods getting out the timber and hauling it to the mills.

The machines for making spools are complicated and require skilled men for their operation. The spools drop from a turning lathe at the rate of one in a second, and must be perfectly uniform and true to a hair's breadth. The finished spools are marketed in this country, largely in Rhode Island, Connecticut, New York and New Jersey, while the spool bars, many of which formerly went to Pawtucket, Rhode Island, are now exported to Greenock and Glasgow, Scotland, and to Hull and Fleetwood, England, shipments being made almost entirely in steamships and chiefly from Bangor, as much as 7,000,000 or 8,000,000 feet having been sent from that port in a season.

One of the pioneer spool makers of Maine was Captain John F. Dearborn, who came to Locke Mills about 1865 from Portsmouth, New Hampshire, after resigning from the navy. He built a spool mill which was operated until 1879, when it burned. At a town meeting at Bryant Pond it was voted to build a mill for Captain Dearborn and to exempt him from taxation for ten years. He continued in the business of spool making until his death, January 29, 1906.

Wood novelties are manufactured at Kingfield, New Vineyard, New Portland and Strong, in Franklin County; Dixfield, Paris, South Paris, West Paris, Bethel, West Bethel, Newry and Milton, in Oxford County; Enfield, Penobscot County; Brownville, Piscataquis County, and Mechanic Falls in Androscoggin County. About one thousand hands are employed

in these establishments, exclusive of the men in the woods, and the amount paid out in wages is close to $500,000. The product is valued at $900,000 to $1,000,000 annually.

BOX SHOOKS.

The manufacture of orange and lemon box shooks in Maine was begun about thirty-five years ago by Going Hathorn in the town of Etna, near Bangor. At first the industry amounted to very little; but in later years, by means of improved machinery, the process of manufacture was so cheapened that Maine, with its superior quality of shooks, was able to compete successfully in the Italian markets with the Austrian manufacturers, although in Austria labor is much cheaper than in this country and the cost of transportation from Trieste to Italian ports is but a small fraction of the freight from Bangor or Eastport. Since the Pan-American Exposition at Buffalo, in 1901, at which was exhibited machinery for the manufacture of box veneers, the Germans and Austrians, by the adoption of that machinery, have competed successfully with the United States industry, much to its detriment, especially during the last year (1905). In former years a good many shooks were shipped from Bangor to Florida, but the destruction of orange trees in that State by frost killed the trade and what little demand has developed since has been supplied by southern manufacturers, who saw shooks from hard pine and other woods. All of Maine's shooks now go to Italy and Sicily.

The factories, four in number, are located at Danforth and Princeton in Washington County, and at Oakfield and Blaine, in Aroostook County. The factories at Danforth, Oakfield and Blaine are owned and operated by Hathorn, Foss & Co., and that at Princeton by C. B. Eaton. Beech, yellow birch and maple are used in the manufacture of fruit box shooks. The logs are cut into four-foot lengths and in this form steamed for several hours, after which they are clamped into a lathe and revolved rapidly against a knife which peels off a sheet or veneer of the required thickness, the sheets running as long as twenty feet. The sheets are then cut into the little boards used for the tops, bottoms and sides of orange and lemon boxes, known as "thinwoods" and bundled. The ends and partitions of the boxes, known as "thickwoods," are sawed straight from the log, like any other boards. The sizes of the thin stock are twenty-eight inches long and one-sixth inch thick, with a width of ten inches for oranges and eleven inches for lemons. They are put up forty pieces in a bundle. The thickwood used for ends and middle pieces is mainly supplied from Austria, while a peculiar chestnut that grows in Italy is used for the hoops.

The export shook trade was developed by the late Thomas J. Stewart, of Bangor, who founded the widely known shipping house of T. J. Stewart & Co., now the T. J. Stewart Company. In the early years of the industry

the bulk of the shipments were made in American vessels, but in recent years the shooks have been carried almost entirely in Italian vessels, owned by the men who own the fruit groves or control the crops. When the trade is prosperous, from twelve to fifteen cargoes of shooks are shipped from Bangor in a season, aggregating from 2,500,000 to 3,500,000 boxes, while several cargoes are sent from Eastport—the product of the Princeton mill. The bulk of the shipments are made through the T. J. Stewart Company, although R. W. Stewart sends several cargoes abroad every year.

This business depends largely upon a rebate clause in the tariff act of 1897 by which it is provided that, in addition to the duty of one cent a pound on oranges, lemons and limes imported into the United States, there shall be an additional duty of 30 percent ad valorem upon the boxes or other foreign packages containing them; but that when the sides, tops and bottoms are made of exported American shooks and the other parts of foreign material the duty shall be 15 percent, thus making a preference in favor of the boxes made of American shooks of 50 percent in the duty.

FURNITURE AND HOUSE FINISH.

The manufacture of furniture in Maine employs about 700 hands, distributed among a great many small concerns. Maine oak is of an inferior quality for this purpose and is little used, the hardwoods most in favor being elm, birch and maple, with some brown ash. The furniture turned out is mostly of a cheap grade and soft woods largely are used in its manufacture.

The term "woodworking plant" is a far-reaching one, but is ordinarily intended to include merely factories for the manufacture of interior and exterior finish. It is said that the manufacture of yellow birch, curly maple, brown ash, white pine and spruce for interior finish has not been as highly developed as it might have been. But, nevertheless, there are more than forty such plants in operation in the first six counties of Maine. Portland leads in this record, but there are plants also at Bangor, Augusta, Lewiston, Belfast, Skowhegan, Auburn, Rockland, Saco, Rumford Falls, Bath, Foxcroft and Pittsfield, where large quantities of sash, doors, blinds, mantels, fire frames, stair and stair posts, carvings, mouldings, cornices, brackets, ship blocks, etc., are produced.

A large part of the hardwoods used in the manufacture of house finish is brought into Maine from the West and South. There is no way of ascertaining the relative quantities of the various woods used, but much of the finish is of white pine, North Carolina pine and whitewood—the latter being much in favor. Besides these woodworking plants there are in Maine about one hundred planing mills and twenty miscellaneous woodworking establishments, the latter manufacturing canthook, rake, broom and brush handles, last blocks, etc.

MISCELLANEOUS PRODUCTS.

The manufacture of small articles from wood in Maine embraces the making of not only interior finish and boxes, but such diversified products as cloth boards, flooring, veneering, powder kegs, ax handles, mallets, rakes, chair stock, swings, lawn furniture, toys, coffins, panels, snow shovels, bowls, washboards, etc. Many of these plants consume 10,000,000 feet of lumber each every year.

There are about seventy concerns engaged in the manufacture of all sorts and sizes of boxes, of spruce and pine, for the domestic market. The Maine sardine, blueberry, vegetable and other canneries require about 2,500,000 boxes annually and other industries as many more. A full pack of Maine sweet corn requires about 1,000,000 boxes, costing $90,000, and an even larger quantity is used by the blueberry, clam and sardine factories, while some of the larger mills in the State run entirely on orders from large manufacturing or commercial centers outside of Maine. It may roughly be estimated that the woodworking industry of Maine, aside from the novelty and spool business, gives employment to 2,500 hands, paying $1,000,000 yearly in wages and having an annual product worth not far from $3,000,000. An important thing to be considered in connection with these industries is that they have given high value to woods that formerly were used only as fuel.

Considering the growth of this industry it is interesting to know the magnitude it had attained in the early '80's. *The Mining and Industrial Journal*, of Bangor, in reviewing the industry of that city, spoke as follows of some of the manufactures in wood in 1883:

> Seven hundred and eighty-five thousand pine and spruce boxes for canned goods and fish packing, valued at upwards of $60,000, were shipped by rail to Gloucester and other points in Massachusetts in 1882. Seven hundred thousand orange and lemon boxes, valued at $60,000, were shipped to Sicily; also upwards of 200,000 to Florida and the West Indies. Other shipments in shooks were 70,000 onion and 21,000 tomato boxes to Bermuda, and 16,000 oil cases by rail to Boston and New York. The latter item is a new business in this locality, and promises to assume considerable magnitude. . . . The total value of box shook shipments was about $140,000. The shipments of barrel shooks include 120,000 cement barrels to New York; 2,000 syrup barrels to Buffalo; 5,000 cranberry barrels to Cape Cod; and 1,000 nut barrels to Sicily; the whole valued at $12,525. Seven firms and individuals shipped last year 1,500,000 last blocks, valued at about $36,000. These are cut from rock maple by various parties in the surrounding and upriver towns, and are shipped principally to New Hampshire and Massachusetts.
>
> One million spool bars, valued at $21,000, were shipped from this port to Glasgow, Scotland, last year; also 250,000, amounting in value to $5,250, to Pawtucket, Rhode Island, and other coastwise ports. A large amount of spool timber, sawed at Howland, some thirty miles above this city, is brought down by rail and shipped from here by water to Searsport, on Penobscot Bay, where it is manufactured into spools. . . . The Willimantic Thread Company . . . also has an immense establishment for the

manufacture of spools at the head of Sebec Lake, now known as the town of Willimantic, Maine. This product all comes through Bangor.

The manufacture and shipment of excelsior can scarcely be called a Bangor industry, as comparatively little is handled in this city. Incidentally, however, it may be mentioned that 2,500 tons, valued at $27,500, were brought down over the Bangor & Piscataquis Railroad in 1882. . . . The larger portion went through by rail. It is manufactured in towns on the line of the Piscataquis railroad, and is nearly all controlled by a single Boston firm. The mills have recently been putting in new machinery and increasing their capacity, and the present year the product will reach fully 3,000 tons.

About 8,000 telegraph and telephone poles, valued at $8,800, were sold here last year; also 70,000 cedar posts, valued at $9,000; and 100,000 railway ties, valued at $30,000. There were sold some 30,000 bean poles, valued at $12.50 per thousand, besides immense quantities of pick poles, hoop poles, etc.

Six firms engaged in handling ship timber in 1882 sold 50,000 knees, valued at $82,750; white pine masts, valued at $10,000; spruce spars and poles, $8,500; and juniper, hackmatack, pine and hardwood ship timber to the value of $51,500; total value $152,750.

The wooden toothpick, let it be understood, is no small thing in the industrial activity of Maine. The original toothpick man is said to have been Charles Foster, of Strong, Franklin County. He whittled the first box of Yankee toothpicks, but he copied the art from natives of South America, where he was a merchant years ago. Foster sent a box to his wife in the United States as a curiosity. A hotel man got hold of them and sent to Foster for a box, and the latter whittled them out and filled the order. More orders came, and pretty soon he had natives whittling out toothpicks for hotels all over the United States. He moved home and in 1860 began making his toothpicks by machinery. The first year he sold sixty-five cases, containing 250,000 toothpicks each.

CHAPTER VIII.

MAINE—LUMBER INSPECTION.

From the time that lumber became an article of commerce, there must have been attempts to establish relative values by means of grading the product according to quality. In previous chapters in this history, some brief examples of early inspection rules have been given. Not only was lumber inspection the subject of much consideration on the part of individuals engaged in the business, arising from the necessity of bringing together buyer and seller on some common basis of agreement as to intrinsic values, but lumber inspection early became the subject of legislative enactment.

In comparatively few states has lumber inspection taken this form, for it seems to have been the conclusion reached through experience, that state legislatures are not well qualified to handle so technical a subject as the grading of lumber, and that definitions thus fixed are too rigid and changed with too little facility to accommodate the constant changes in the usages of the lumber business, in the character of material placed upon the markets and in the needs of consumers. Nevertheless, a number of states, conspicuous among which is Maine, have legislated in regard to this matter. Most of them have been content with the establishment of machinery for the application of inspection rules, while some have gone farther and have defined the grades into which lumber should be divided.

The subject of lumber inspection is one of the most difficult with which the industry has to contend, as no two trees are precisely alike, so no two boards, cut even from the same tree, are precisely alike. Yet, with the wide difference in intrinsic value of different boards or different lots of lumber, or of the product of different competing producing sections, it became necessary to establish some basis by which might be determined the relative values of different lots of lumber or even of different boards.

The history of lumber inspection has been one of constant development. In early times lumber was frequently divided into simply two classes—one which was marketable and another which was considered worthless. Such a division, however, did little toward the accomplishment of the purpose of grading, and the marketable product was soon divided into two or three grades. Then, as lumber became of more value and warranted the expenditure of time and money, and as the require-

ments of dealers and consumers became more sharply defined, grades multiplied, until now there are scores of grades or subdivisions of grades in place of the two or three or four of a half century ago.

The division of lumber into grades is called by various names. It is known as "surveying" in Maine and some other eastern localities, and the Maine system of grades as the "Maine surveying." In eastern Canada the process of inspection is called "culling," and for the Quebec market there is the famous "Cullers' act." In Albany, when that market was the leading one in the United States, the grading of lumber was termed "inspection," and that term has been in general use ever since throughout the country west of the Hudson River.

Since Maine was the first large source of commercial lumber among the northeastern states, it was natural that a systematic classification and grading of mill output should have been established in that State. White pine was the kind of lumber mainly handled, and it followed that the inspection rules first made applicable in the selling of lumber should have pertained to that product. In a general sense it can be said that lumber grading or inspection for the entire country originated in Maine. In making this statement, however, we should not overlook the fact that at an early date a system was established for the guidance of the Canadian timber trade called "Quebec culling," which may have originated anterior, or at least contemporaneously, with the system of "survey," as inspection or grading was called in Maine.

The following is a copy of the Maine inspection law as it appears in the statutes of that State:

BOARDS, PLANK AND OTHER LUMBER.

Sec. 14. Every town, at its annual meeting, shall elect one or more surveyors of boards, plank, timber and joist; one or more surveyors of shingles, clapboards, staves and hoops; and every town containing a port of delivery whence staves and hoops are usually exported, shall also elect two or more viewers and cullers of staves and hoops; and the municipal officers of a town may, if they deem it necessary, appoint not exceeding seven surveyors of logs.

Sec. 15. All boards, plank, timber and joist, offered for sale, shall, before delivery be surveyed by a sworn surveyor thereof, and if he has doubts of the dimensions, he shall measure the same, and mark the contents thereon, making reasonable allowance for rots, knots and splits, drying and shrinking; pine boards three-fourths of an inch thick when fully seasoned, and in that proportion when partly seasoned, shall be considered merchantable; and no pine boards, except sheathing boards, shall be shipped for exportation beyond the United States, but such as are square edged, and not less than seven-eighths of an inch thick, nor less than ten feet long, under penalty of forfeiture to the town whence shipped.

Sec. 16. All shingles, packed for exportation beyond the State, shall be sixteen inches long, free from shakes and wormholes, and at least three-eighths of an inch thick at the butt end when green, and if of pine, free from sap. They shall be four inches wide on an average, not less than three inches wide in any part, hold their

width three-fourths of the way to the thin end, well shaved or sawed, and be denominated "number one;" but shingles intended for sale within the State, if of inferior quality or of less dimensions, may be surveyed and classed accordingly, under the denominations of "number two" and "number three."

Sec. 17. All shingles shall be split or sawed crosswise the grain; each bundle shall contain two hundred and fifty shingles, and if in square bundles, twenty-five courses, and be twenty-two inches and a half at the lay; and when packed to be surveyed as "number one" or for exportation, if in any bundle there are five shingles deficient in the proper dimensions, soundness or number, to make two hundred and fifty merchantable shingles, or if any shingles are offered for sale, before they are surveyed and measured by a sworn surveyor of some town in the county where they were made, and the quality branded on the hoop or band of the bundle, unless the parties otherwise agree, they are forfeited to the town where the offense is committed.

Sec. 18. All clapboards, exposed for sale or packed for exportation, shall be made of good, sound timber, free from shakes and wormholes, and if of pine, clear of sap; and they shall be at least five-eighths of an inch thick on the back or thickest part, five inches wide, and four feet six inches long, and straight and well shaved or sawed.

Sec. 19. Staves packed for sale or exportation shall be well and proportionably split, and of the following dimensions, viz:

White oak butt staves, at least five feet in length, five inches wide, and one inch and a quarter thick on the heart or thinnest edge, and every part thereof;

White oak pipe staves, at least four feet and eight inches in length, four inches broad in the narrowest part, and not less than three-quarters of an inch thick on the heart or thinnest edge;

White or red oak hogshead staves, at least forty-two inches long, and not less than half an inch thick on the least or thinnest edge;

White or red oak barrel staves for a market out of the United States, thirty-two inches long; if for use within the United States, thirty inches long; and in every case, half an inch thick on the heart or thinnest edge;

All white or red oak hogshead or barrel staves, at least, one with another, four inches in breadth, and not one less than three inches in breadth in the narrowest part; those of the breadth last mentioned shall be clear of sap; and two staves shall be sold as one cast; fifty casts, one hundred staves; and ten hundred staves, one thousand.

Sec. 20. All hogshead hoops, exposed for sale or packed for exportation, shall be from ten to thirteen feet in length, and of oak, ash or walnut, and of good and sufficient substance, well shaved, if of oak or ash, at least one inch broad, and, if of walnut, three-quarters of an inch at the smallest end; the different lengths shall be made up in bundles by themselves; each bundle shall contain twenty-five hoops, four bundles shall make one hundred, and ten hundred hoops, one thousand; and every bundle, packed for sale or exportation, found to be deficient in number or dimensions, is forfeited to the town where it is exhibited.

Sec. 21. No person shall deliver on sale, or ship or attempt to ship for exportation, any boards, plank, timber, joists, shingles, clapboards, staves or hoops, before they have been surveyed, measured, viewed or culled, as the case may be, and branded by the proper officer and a certificate thereof given by him, specifiying the number, quality and quantity thereof, under a penalty of two dollars a thousand, by quantity or tale, as such article is usually sold, half to the town where the offense is committed, and half to the prosecutor; and in addition thereto, the master or owner of any vessel, exporting any of the articles aforesaid beyond the limits of the United States contrary to law, shall, for the first offense, forfeit two hundred dollars to the town whence said

articles are exported, and if after conviction he commits a second offense in the same vessel, he forfeits the same sum, and the vessel is also forfeited to the town.

Sec. 22. In any action hereafter brought for the price of boards, plank, timber, joists, shingles, clapboards, staves or hoops, unless sold by the cargo, any failure to survey, measure, view or cull and brand the same and to take certificate thereof as required by section twenty-one, shall not defeat recovery in such action, unless it appears that before delivery the purchaser requested such survey, measurement, view or culling, and branding and certificate.

Sec. 23. The master or owner of any vessel having any of the lumber or other articles mentioned in section twenty-one on board, for exportation as aforesaid, shall, before the vessel is cleared at the custom house, produce to the collector a certificate from the proper officer, that the same have been duly surveyed, measured, viewed or culled, as the case may require; and such master or owner shall likewise make oath before the collector, or a justice of the peace, whose certificate shall be returned to the collector, that the articles so shipped for exportation are the same articles thus surveyed, measured, viewed or culled; that he has no others on board of the like description, and that he will not take any others.

Sec. 24. If any person, duly elected a surveyor, measurer, viewer or culler, of any of said articles under this chapter, neglects or refuses to take the oath of his office and to serve therein, he forfeits three dollars to the town, and another person shall be elected to his place, who shall take the oath and serve as aforesaid under the like penalty; and the like proceedings shall be had, until the office is filled; or if any such officer duly qualified unnecessarily refuses or neglects to attend to the duties of his office when requested, he forfeits three dollars; and if he connives at or willingly allows any breach of the provisions hereof, or practices any other fraud or deceit in his official duties, he forfeits thirty dollars to the use aforesaid.

Sec. 25. All pecuniary penalties aforesaid may be recovered by action of debt, indictment or complaint, and all other forfeitures, by a libel filed by the treasurer or any inhabitant of the town interested.

LOGS.

Sec. 26. Surveyors of logs may inspect, survey and measure all mill logs floated or brought to market or offered for sale in their towns, and divide them into several classes, corresponding to the different quality of boards and other sawed lumber, which may be manufactured from them; and they shall give certificates under their hands of the quantity and quality thereof to the person, at whose request they are surveyed.

Under authority of this law rules for the survey or inspection of lumber were formulated and established. The grading rules were framed with especial reference to white pine; while, now, spruce is the chief species that enters into lumber commerce, and the trade has developed terms of dimensions and quality that were not contemplated in the original enactments.

Fifty years ago the lumbermen of New York, Connecticut and contiguous states made annual voyages to Bangor and other points in Maine for their supplies of pine and spruce lumber. Year by year have the forests of Maine yielded to the brawn and muscle of the lumbermen and the insatiate appetite of the saws, until today the character of the pine resources of the State is well depicted in the designations which attest the

prevailing systems of inspection. While the quantity of pine is very much reduced, the quality of it has also deteriorated in proportion, and the "survey" is less to the advantage of the purchaser. Maine still boasts a large supply of spruce and hemlock, and will be able to supply these for many years. The survey of spruce is rather in favor of the purchaser.

PINE.

No. 1.—Is entirely dispensed with, and the highest quality now recognized is called No. 2.

No. 2.—This may be of any length or width, provided, however, that the short lengths and narrows must be good; the shorter and narrower the board, the better the quality required. A board twelve feet long and five or six inches in width must be entirely free from knots and sap and must be straight in grain. Larger boards must be nearly free from knots, sap and shake.

No. 3.—Must be free from shakes, but a few knots or a little sap will not condemn it. The size of the board goes far to determine this quality; very small pieces, otherwise up to grade, should be classed as No. 4.

No. 4.—Is a small board usually free from knots, but with some sap. If large boards are put into this number, it is because one-quarter or one-third of the piece is shaky, although the balance may be good.

The market recognizes, also, two kinds of shipping boards (designated "shippers") viz: "smooth" and "common."

Smooth Shippers.—All boards without shake or case knots, or any large knots.

Common Shippers.—All boards coarse and knotty, eight inches and upward in width, twelve feet and upward in length. (These are sometimes manufactured under special orders, when they may be nine inches, ten inches, or even greater widths.) In this grade, splits, red streaks or very shaky boards are objectionable.

Narrows, or Narrow Boards.—Is the next grade to common shippers, and consist of boards too small for shippers. These must not be very coarse. must be suitable for floor boards.

Poor Fours.—These consist of sappy, shaky, or knotty boards, not suited to be classed in either of the foregoing descriptions.

Scoots.—Are the lowest grade; rotten boards and all others not admissible in other grades are surveyed as scoots.

The market handles also what are termed "sapling pine" or "gang boards." These are usually manufactured in gang mills, the survey as to quality being about the same as the balance of the grades described, except as to designation, the 2's, 3's and 4's being put together under the one term "planers." The shippers, narrow boards, poor 4's and scoots are surveyed as described under those heads.

Gutter and Deck Plank.—The rule last described is also applied to gutter and deck plank.

SPRUCE.

Spruce is known in the two qualities of merchantable and "scoots." The scoots comprise boards which are cross grained, renty, or rotten. In surveying, the grades are divided into two qualities, viz: "floor boards" and "coarse." The floor boards must be nearly free from knots, all others are coarse.

CHAPTER IX.

MAINE—STATISTICS.

The forests continue to be the basis of one of the leading industries of Maine, after a century of exploitation and after generations of active lumbering. In the first table is shown the relation between the forest products (including lumber and timber products, planing mill products and wooden packing boxes) and the total of all industries as determined by the twelfth census. There were in 1899, the year covered by the census of 1900, seventy establishments producing dressed lumber, sash, doors, blinds, etc. They had a capital of $1,351,555, and gave employment to 742 wage-earners, to whom $351,793 was paid in wages. The miscellaneous expenses involved amounted to $69,839, the materials used were valued at $767,908 and the total value of the product was $1,414,504. The wooden packing box factories numbered twenty-eight and their product was valued at $599,858.

Grouping these two classes and the sawmill and timber class (figures of which are given farther on) we have, showing the proper proportion between forest products and all industries, the following table:

RELATION OF FOREST PRODUCTS TO ALL MANUFACTURES.

	Total, all industries.	Total, forest products.	Percentage of forest to whole.
Number of establishments	6,702	936	14.0
Capital	$122,918,826	$17,560,542	14.3
Average number of wage-earners	74,816	7,980	10.7
Total wages paid	$28,527,849	$3,142,530	11.0
Miscellaneous expenses	$7,774,216	$615,806	7.9
Cost of materials used	$68,863,408	$9,110,525	13.2
Value of products	$127,361,485	$15,503,763	12.2

The above figures would have been larger if the census grouping of "lumber and its remanufactures" had been adopted, with its capital of $19,375,173 and product of $17,853,244.

Following is a comparative table of the principal items making up the lumber statistics, from 1850 to 1900, inclusive. The figures reported previous to 1850 are too inaccurate or incomplete to admit of comparison. The census lumber statistics, unless otherwise stated, include sawmills, planing mills operated in connection with sawmills, and timber camps. The comparative figures are as follows:

COMPARATIVE LUMBER STATISTICS, 1850-1900—MAINE.

	1850.	1860.	1870.[1]	1880.	1890.[2]	1900.[2]
Number of establishments	732	926	1,099	848	894	838
Capital	$3,009,240	$4,401,482	$6,614,875	$6,339,396	$12,978,315	$15,764,538
Number of wage-earners	4,430	4,969	8,506	6,663	11,540	6,834
Wages	$1,301,376	$1,453,739	$2,449,132	$1,161,142	$2,689,845	$2,633,771
Cost of materials used	$3,609,247	$4,504,368	$6,872,723	$4,951,957	$6,228,808	$7,994,596
Value of products	$5,872,573	$7,167,762	$11,395,747	$7,933,868	$11,849,654	$13,489,401

[1]For purposes of comparison the values of 1870 should be reduced about twenty percent because of a depreciated currency for that year.

[2]Prior to 1890 the reports of operations designated as "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900. In making comparisons the presence of these figures in the censuses of 1890 and 1900 should be considered.

Some might add to these figures those representing the building of wooden ships and boats. There were 115 establishments devoted to that business in 1900, producing a product valued at $2,491,765.

Comparing the figures of 1900 with those of 1890, it is not strange that the number of establishments should have decreased more than six percent while the value of products increased nearly 14 percent, but it may seem strange that the average number of wage-earners employed in that industry should have decreased by nearly 41 percent. Undoubtedly, this is the result of the enormous improvements that in ten years took place in the mechanical equipment of the sawmills. In 1890 there was but one modern sawmill on the Penobscot River; all the rest were gang and circular mills, chiefly the former, with an almost entire lack of labor-saving secondary machinery. The same was practically true in the other manufacturing districts of the State. In the ten years following, however, the mills were largely rebuilt and equipped with such things as steam log turners, live rolls, automatic transfers, gang edgers and trimmers and other machinery for lessening labor. Notwithstanding this decrease in number of wage-earners, the wages paid decreased less than 2½ percent.

There were in Maine, according to the United States census of 1900, 204 timber land owners with an invested capital of $4,427,513. The area under ownership was 2,107,606 acres. The average quantity of merchantable timber an acre was 2,000 feet and the estimated total quantity of merchantable timber was 4,317,500,000 feet. These figures, however, are only partial and their value is confined to the deductions that can be drawn from them as to averages. The stumpage value per 1,000 feet was as follows: White pine, $2.51; hemlock, $2.52; spruce, $2.70.

The following table shows the entire lumber product for Maine, including rough lumber (by species), shingles, all sawmill products, planing mill products and all timber camp products in 1899. The quantities and values for these items are as follows:

FOREST PRODUCTS OF MAINE—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value
CONIFERS:		
White pine	214,196,000	$2,516,222
Hemlock	85,400,000	925,029
Spruce	409,533,000	4,933,535
Cedar	7,354,000	57,815
Norway pine	2,400,000	22,800
Tamarack	2,500,000	50,000
All other conifers	6,402,000	67,231
Total, conifers	727,785,000	$8,572,632
HARDWOODS:		
Ash	1,259,000	$ 16,019
Birch	14,061,000	164,748
Elm	68,000	683
Hickory	100,000	1,800
Basswood	901,000	9,994
Oak	7,608,000	107,148
Poplar	578,000	5,875
Maple	3,427,000	39,314
Other hardwoods	728,000	8,524
Total, hardwoods	28,730,000	$354,105
Total, rough lumber	756,515,000	$8,926,737

SHINGLES.

	Quantity, pieces.	Value.
White pine	30,196,000	$ 55,052
Cedar	332,816,000	666,414
Hemlock	15,761,000	21,026
Spruce	78,078,000	148,134
Other conifers	8,876,000	12,684
All hardwoods	135,000	189
Total, shingles	465,862,000	$903,499

COOPERAGE MATERIALS.

	Quantity.	Value.
Hoops, pieces	670,000	$ 2,945
Staves, pieces	70,489,000	293,171
Headings, sets	3,911,950	115,212
Total, cooperage materials	.....	$411,328

OTHER SAWED PRODUCTS.

Bobbin and spool stock, feet b. m.	26,254,000	$ 294,705
Furniture stock, feet b. m	605,000	9,580
Agricultural implement stock, ft. b. m.	20,000	280
Carriage and wagon stock, feet b. m.	584,000	17,520
Pickets and palings, feet b. m.	669,000	7,336
Lath, pieces	217,376,000	364,654
All other sawed products	.....	1,179,009
Total, other sawed products	.....	$1,873,084

TIMBER CAMP PRODUCTS.

Cooperage stock, cords	2,370	$ 13,000
Excelsior stock, cords	1,000	4,000
Fence posts, pieces	500	30
Hop poles, pieces	130,000	600
Hewed timber, feet b. m.	1,560,000	11,225
Logs cut for export, feet b. m.	600,000	6,300
Logs cut for domestic sale, feet b. m.	24,419,000	182,990
Handle stock, cords	100	600
Hemlock bark, cords	4,497	13,952
Railway ties, pieces	84,500	17,025
Masts and spars, pieces	40	450
Ship knees, pieces	50	100
Telegraph poles, pieces	4,235	5,135
All other products	.....	42,129
Amount received for contract work	.....	10,600
Total, timber camp products	.....	$308,136
Total, planing mill products	$1,704,702	
Less value of lumber used	1,242,701	$462,001
Grand total, value forest products	.....	$12,884,785

The average amount invested in machinery in each of the sawmills, planing mills attached to sawmills, and timber camps, according to the twelfth census, was $3,200; the average annual product of each establishment was $16,097; the average number of wage-earners in each establishment was eight; the average product of each wage-earner was $1,974, and the average annual wages of each wage-earner was $385.

COMPARISON OF 1899 AND 1904.

The following table shows a comparative summary of the lumber and timber products of Maine according to the census of 1900 and 1905, including the principal items of the census, and also the quantity, value and principal varieties of rough lumber. It will be found that the figures for 1900 in this table do not agree with the figures for the same items in the previous tables. This is explained by the fact that in the schedules for 1905 the custom mills were not included; consequently, for purposes of comparison, the same were deducted from the 1900 figures. The table is as follows:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—MAINE.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	647	752
Capital	$12,732,673	$15,083,395
Salaried officials, clerks, etc.:		
Number	312	500
Salaries	$252,344	$369,242
Wage-earners:		
Average number	9,671	12,028
Wages	$3,439,507	$5,429,798
Miscellaneous expenses	$940,365	$2,538,186
Cost of materials used[1]	$6,594,268	$9,114,973
Value of products[1]	$13,281,561	$19,968,525
Quantity, Value and Principal Varieties of Rough Lumber:		
Spruce:		
Thousand feet b. m.	401,867	449,192
Value	$4,848,779	$6,523,587
White pine:		
Thousand feet b. m.	201,740	245,059
Value	$2,377,097	$3,583,950
Hemlock:		
Thousand feet b. m.	76,959	97,612
Value	$837,209	$1,138,010
Birch:		
Thousand feet b. m.	13,387	18,342
Value	$158,117	$347,626
Oak:		
Thousand feet b. m.	7,274	7,170
Value	$102,403	$127,254
Cedar:		
Thousand feet b. m.	6,852	3,671
Value	$55,565	$67,201
Maple:		
Thousand feet b. m.	3,269	2,568
Value	$37,187	$39,615
All other:		
Thousand feet b. m.	41,750	40,246
Value	$498,344	$504,158
Total quantity, thousand feet b. m.	753,098	863,860
Total value	$8,914,701	$12,331,401

[1]Includes a duplication—the value of rough lumber, which in 1905 amounted to $2,030,842, remanufactured in planing mills connected with sawmills producing it.

EXPORTS AND IMPORTS OF FOREST PRODUCTS.

Maine, from its settlement to the present, has not only contributed to the lumber and timber supply of other American sections, but has

been an exporter to foreign markets as well. In previous chapters the beginnings and development of this trade have been described. Following is given a statement of the forest products exported from Maine to foreign countries during the last fifty years—1856-1905. These statistics, by custom house districts, are not available prior to 1856, the records at Washington having deen preserved only since that date in such form as to be accessible. From many of the minor ports shipments or imports have been occasional only, and where in the following tables certain years are omitted it is because there were no imports or exports reported for those years.

The following table shows the exports of timber and unmanufactured lumber from Bangor to foreign countries, so far as they are recorded in the Government archives at Washington:

EXPORTS OF UNMANUFACTURED LUMBER FROM BANGOR.

Year.	Logs.	Sawed lumber.		Shingles.		Shooks.	Staves and headings.	All other unmanufactured.
	Value.	Feet b. m.	Value.	Quantity.	Value.	Value.	Value.	Value.
1856	.....	8,122,000	$106,418	4,053,000	$12,261	.....	.....	$ 3,516
1857	.....	11,203,000	145,307	3,620,000	11,080	.....	.....	9,681
1858	.....	12,574,000	160,868	5,115,000	15,191	.....	.....	39,610
1859	.....	12,131,000	154,845	3,062,000	7,705	.....	$ 4,423	6,738
1860	.....	9,269,000	113,923	2,698,000	6,851	.....	1,312	50,757
1861	.....	13,060,000	157,636	3,279,000	8,269	.....	7,140	35,377
1865	.....	25,483,000	507,978	7,212,000	22,222	$ 49,661	3,668	7,370
1867	.....	11,684,000	232,823	4,579,000	19,373	60,921	137	6,738
1868	.....	10,288,000	192,692	4,545,000	19,165	61,042	2,329	3,699
1869	$3,136	10,396,000	192,104	2,948,000	13,937	149,718	29,602	887
1870	8,042	7,019,000	130,842	2,328,000	8,932	189,954	.....	.....
1871	1,269	4,633,000	82,744	3,667,000	13,254	154,841	.....	55
1872	1,058	4,213,000	75,732	3,812,000	17,439	157,493	.....	32
1873	1,214	8,707,000	165,456	6,518,000	18,786	189,254	.....	371
1874	1,740	13,127,000	201,224	2,959,000	7,500	118,792	.....	1,532
1875	1,820	21,316,000	279,009	2,559,000	8,419	155,280	.....	4,482
1876	1,113	18,889,000	206,107	2,616,000	7,934	131,664	.....	3,342
1877	1,054	14,386,000	154,130	975,000	2,482	188,928	.....	2,229
1878	4,301	10,353,000	109,028	1,861,000	5,928	60,526	.....	1,658
1879	1,888	5,148,000	58,479	1,866,000	5,578	184,188	.....	604
1880	254	2,344,000	24,220	638,000	1,920	153,419	.....	344
1881	861	2,360,000	35,291	2,168,000	7,595	165,479	.....	298
1882	465	1,143,000	17,639	845,000	2,719	154,091	.....	241
1883	857	2,843,000	36,846	1,328,000	4,581	147,614	.....	12,496
1884	467	1,849,000	26,532	1,312,000	4,457	50,129	200	24,603
1885	388	1,856,000	25,609	1,089,000	2,808	103,049	.....	34,406
1886	817	1,949,000	27,570	1,033,000	2,972	92,297	.....	72,748
1887	804	1,562,000	21,386	1,506,000	3,308	58,151	322	41,948
1888	134	3,552,000	58,551	791,000	1,323	53,236	292	20,550
1889	1,234	3,937,000	71,011	2,347,000	4,545	5,520	.....	895
1890	285	1,317,000	18,746	1,312,000	2,539	32,716	.....	60,973
1891	1,133	736,000	10,731	586,000	1,011	76,523	.....	102,268
1892	832	498,000	7,135	220,000	469	51,031	320	55,532
1893	839	1,240,000	21,664	200,000	425	53,112	.....	80,279
1894	954	953,000	23,460	400,000	613	18,740	257	52,518
1895	749	1,337,000	23,682	357,000	564	67,609	444	41,604
1896	1,078	973,000	20,235	.....	.....	111,408	.....	88,023
1897	1,878	10,810,000	121,475	.....	.....	116,672	235	60,916
1898	647	7,851,000	93,627	50,000	63	93,542	.....	146,500
1899	307	21,535,000	235,000	25,000	48	48,092	.....	83,292
1900	645	5,832,000	85,027	204,000	553	92,401	.....	158,606
1901	367	8,285,000	127,271	25,000	58	.....	.....	129,601
1902	1,260	799,000	20,519	148,000	225	127,301	.....	58,966
1903	2,650	2,334,000	78,819	.....	.....	59,470	.....	120,073
1904	7,528	5,756,000	139,244	1,000	4	114,784	.....	86,386
1905	1,251	4,098,000	87,523	.....	.....	60,203	.....	173,780

[1] Includes headings.

The values of exports of manufactures of lumber from Bangor during the same period were as follows, according to the same authority:

VALUES OF LUMBER MANUFACTURES EXPORTED FROM BANGOR.

Year.	Doors, sash and blinds.	Furniture.	Hogsheads and barrels.	Trimmings and mouldings.	Woodenware.	All other manufactures.
1856	.....	.....	.....	.....	.....	$23,652
1857	.....	.....	.....	.....	.....	117,112
1859	.....	$ 454	.....	.....	.....	143,828
1860	.....	291	.....	.....	.....	[1]210
1861	.....	.....	.....	.....	.....	[1]688
1865	$ 339	278	$ 611	.....	$ 58	45
1867	.....	.....	408	.....	.....	4,974
1868	.....	352	1,230	.....	.....	1,590
1869	.....	.....	.....	.....	.....	3,572
1870	.....	1,373	2,004	.....	.....	2,965
1871	.....	419	1,304	.....	44	1,336
1872	.....	.....	137	.....	.....	1,310
1873	.....	.....	94	.....	.....	1,701
1874	.....	.....	.....	.....	.....	2,554
1875	.....	15	.....	.....	.....	783
1876	.....	135	3,450	.....	.....	950
1877	.....	.....	4,847	.....	.....	528
1878	.....	.....	50	.....	.....	506
1879	.....	.....	.....	.....	.....	110
1880	.....	.....	.....	.....	.....	115
1881	.....	245	.....	.....	.....	435
1882	.....	129	.....	.....	3	448
1883	.....	.....	.....	.....	.....	7,402
1884	.....	27	.....	.....	.....	480
1885	23	82	.....	.....	.....	40
1886	.....	80	.....	.....	.....	178
1887	.....	.....	.....	.....	.....	260
1888	.....	.....	.....	.....	.....	8,607
1889	.....	.....	.....	.....	.....	68,511
1890	.....	221	.....	$ 204	.....	39,923
1891	69	.....	.....	.....	.....	141
1892	.....	80	.....	130	.....	206
1893	68	9,016	.....	60	27	2,079
1894	22	33,342	.....	541	.....	66,336
1895	13	37,948	.....	389	.....	14,343
1896	229	37,332	.....	514	14	12,081
1897	205	40,303	.....	585	.....	6,619
1898	47	46,842	.....	543	22	9,907
1899	4	41,440	50	390	881	5,743
1900	6,557	40,740	.....	150	1,536	9,756
1901	69	55,730	.....	126	2,803	9,185
1902	18,244	56,153	.....	115	1,999	10,133
1903	56,907	91,075	.....	1,388	1,493	7,657
1904	12,592	83,782	.....	611	2,774	6,176
1905	1	68,685	40	371	456	7,775

[1]Includes all manufactures, except furniture.

The following exports of wood pulp from the port of Bangor, included in the last column above, are on record at Washington:

WOOD PULP EXPORTED FROM BANGOR.

Year.	Pounds.	Value.	Year.	Pounds	Value.
1898	9,106,000	$43,376	1902	151,812	$2,882
1899	9,374,890	31,850	1904	255	4
1901	84,651	1,685	1905	59,944	1,154

The next table shows the quantity and value of timber and unmanufactured lumber exported from the custom house district of Portland and Falmouth, the port of which is Portland. Falmouth is a suburb of Portland, being situated on an estuary north of the city, but it was one of the

old names of Portland itself. The first attempted settlement on an island in the harbor was named York, but the first permanent settlement on the present site of the city was called Stogomor, which was shortly changed to Casco Neck. In 1658 the name was changed to Falmouth, which was retained for a long period. The nomenclature of the customs district, of which Portland is the port, is an instance of the retention of practically obsolete names by the national Government. The figures, as given in the Government records, are as follows:

TIMBER AND UNMANUFACTURED LUMBER EXPORTED FROM PORTLAND.

Year.	Logs.	Sawed lumber.		Shingles.		Shooks.	Staves and headings.	All other unmanufactured.
	Value.	Feet b. m.	Value.	Quantity.	Value.	Value.	Value.	Value.
1856	.....	8,913,000	$118,906	256,000	$ 639	.....	$ 37,955	$120,575
1857	.....	12,040,000	160,573	1,135,000	3,690	.....	.....	84,167
1858	.....	16,762,000	230,937	1,064,000	2,869	.....	147,916	59,200
1859	.....	18,738,000	251,405	1,063,000	2,592	.....	222,345	.....
1860	.....	16,720,000	223,304	930,000	2,369	.....	187,420	.....
1861	.....	15,874,000	209,502	1,062,000	2,881	.....	160,762	64,460
1862	.....	24,979,000	304,321	2,210,000	5,856	.....	366,343	545,339
1863	.....	18,912,000	240,586	976,000	3,001	.....	618,084	682,277
1864	.....	13,957,000	260,981	1,408,000	4,548	$1,031,377	62,412	207,957
1865	.....	20,646,000	509,016	1,195,000	4,903	1,554,235	79,525	212,395
1867	.....	6,730,000	139,723	2,147,000	9,040	820,620	42,549	71,032
1868	.....	7,257,000	136,988	1,572,000	5,325	857,445	71,753	42,496
1869	$ 93,146	7,360,000	131,842	547,000	2,070	[1]686,935	.....	4,412
1870	140,965	3,248,000	60,757	671,000	2,672	[1]767,314	.....	21,312
1871	501	1,136,000	12,370	499,000	2,003	[1]744,989	.....	158,011
1872	.....	4,366,000	72,521	537,000	1,899	[1]607,392	.....	56,085
1873	.....	7,476,000	123,131	750,000	2,980	[1]633,170	.....	106,225
1874	.....	7,384,000	117,965	1,218,000	5,065	[1]733,481	.....	132,424
1875	.....	11,419,000	192,030	225,000	728	[1]1,055,658	.....	28,929
1876	2,621	12,189,000	173,625	327,000	615	[1]912,412	.....	43,570
1877	1,500	12,972,000	166,495	1,302,000	2,368	[1]796,156	.....	30,563
1878	.....	13,034,000	159,161	623,000	1,048	[1]772,569	.....	35,758
1879	.....	7,469,000	110,567	1,081,000	2,422	[1]937,614	.....	58,514
1880	.....	5,878,000	78,071	1,424,000	2,577	[1]907,688	.....	31,526
1881	.....	4,969,000	79,513	476,000	851	[1]798,860	.....	12,327
1882	.....	7,968,000	134,041	1,125,000	2,215	[1]763,809	.....	18,277
1883	.....	5,218,000	97,635	544,000	1,199	[1]1,049,858	.....	36,444
1884	.....	12,578,000	216,286	1,624,000	3,047	573,874	104,555	6,977
1885	.....	12,397,000	197,944	2,257,000	6,236	493,965	111,058	9,783
1886	.....	12,097,000	167,845	687,000	1,179	412,082	75,937	5,346
1887	848	2,794,000	54,979	871,000	1,509	359,109	25,083	25,115
1888	105	5,332,000	121,705	459,000	844	304,397	18,896	42,791
1889	653	9,600,000	217,366	898,000	1,732	312,792	11,561	50,189
1890	900	3,163,000	87,025	565,000	1,138	321,567	.....	64,523
1891	.....	540,000	12,570	323,000	520	153,563	24,217	7,115
1892	.....	231,000	3,510	298,000	512	182,110	25,556	70,933
1893	.....	1,839,000	34,768	65,000	125	255,668	18,605	77,891
1894	.....	3,897,000	109,600	165,000	292	164,640	5,004	1,979
1895	.....	4,020,000	72,784	50,000	100	266,428	3,018	70,797
1896	2,130	3,776,000	64,717	175,000	278	253,160	16,847	113,815
1897	.....	5,462,000	102,526	35,000	60	245,402	3,685	125,364
1898	3,580	6,272,000	96,972	30,000	51	200,160	1,688	129,681
1899	10,518	3,121,000	46,478	288,000	471	161,177	2,028	153,554
1900	1,456	2,198,000	58,270	68,000	146	178,133	22,648	79,727
1901	530	3,948,000	93,582	.....	.....	139,122	25,395	10,241
1902	1,395	733,000	17,482	.....	.....	222,893	24,027	2,268
1903	3,500	1,726,000	34,854	.....	.....	197,315	22,303	20,429
1904	8,350	1,056,000	28,707	.....	.....	163,008	23,095	10,141
1905	11,300	1,143,000	32,517	.....	.....	79,421	[2]350	43,060

[1]Includes headings.
[2]Headings only.

It will be noted in the above that the importance of Portland as a

lumber exporting point is apparently over, 1886 being the last year of large exportations of sawed lumber. Those now made consist of a few cargoes annually to the West Indies or South America. It is, however, a considerable transhipment port for Canadian lumber during the winter, a business which does not enter into these tables. In some other lumber commodities Portland has better maintained its export trade, notably in shooks; but the value during 1905 shows a marked contrast with the values obtaining forty years previous.

The values of exports of manufactures of lumber from Portland and Falmouth during the same period were as follows, according to the same authority:

VALUE OF LUMBER MANUFACTURES EXPORTED FROM PORTLAND.

Year.	Furniture.	Hogsheads and barrels.	Woodenware.	All other manufactures.
1856	$ 1,858	.....	.....	[1]$419,657
1857	3,066	.....	.....	[1]654,183
1858	4,623	.....	.....	[1]399,699
1859	1,345	.....	.....	[1]430,820
1860	1,562	.....	.....	[1]509,290
1861	553	.....	.....	[1]457,299
1862	696	.....	.....	[1]550
1863	958	.....	.....	[1]2,264
1864	1,050	$ 5,125	$ 5	2,640
1865	1,557	8,774	.....	5,260
1867	1,245	23,228	.....	114,322
1868	786	24,047	.....	126,650
1869	6,638	.....	15,748	74,176
1870	4,546	34,365	425	1,515
1871	6,414	17,804	2,467	5,288
1872	348	12,090	.....	9,837
1873	15,795	8,540	.....	28,700
1874	.....	15,414	.....	37,805
1875	1,116	16,446	.....	27,673
1876	25,738	8,845	1,312	14,983
1877	5,248	13,693	.....	6,214
1878	1,225	5,839	.....	4,698
1879	1,973	16,615	895	1,296
1880	.....	3,129	.....	374
1881	.....	6,530	.....	4,955
1882	1,000	8,354	.....	9,430
1883	2,155	14,525	1,600	3,680
1884	.....	11,933	5,734	4,997
1885	985	10,017	.....	1,200
1886	1,732	8,906	217	3,828
1887	3,323	17,839	133	2,291
1888	1,434	28,442	136	511
1889	722	13,332	9	1,336
1890	379	22,690	15	2,823
1891	31	10,843	.....	696
1892	.....	11,031	.....	198
1893	35	10,830	18	129
1894	716	4,617	4	131,214
1895	3,229	4,728	.....	3,089
1896	733	.....	5	25
1897	714	27	.....	2,959
1898	1,155	.....	.....	11,207
1899	6,255	.....	.....	2,608
1900	319	.....	.....	7,074
1901	119	4	1,807	7,361
1902	75	.....	195	33,333
1903	250	.....	.....	10,118
1904	1,870	.....	113	19,639
1905	20,949	.....	220	40,462

[1]Includes all manufactures of wood except furniture.

It may again be explained that these general tables, of which the above is an example, contain all the items shown in the treasury records, but grouped for purposes of convenience. An important item in all of the northern ports is the exportation of wood pulp, the records of which have been kept separate, appearing above under the miscellaneous items, only within recent years; therefore it seemed wise to give these exportations in separate tables.

The following exports of wood pulp from Portland are on record at Washington:

WOOD PULP EXPORTED FROM PORTLAND AND FALMOUTH.

Year.	Pounds.	Value.	Year.	Pounds.	Value.
1898	4,612,300	$ 46,907	1902	9,378,361	$161,517
1899	16,474,116	200,444	1903	2,339,568	46,522
1900	5,049,990	73,784	1904	357,841	7,129
1901	13,526,192	191,281	1905	1,024,710	15,371

Government records at Washington exhibit the following exports from Bath in the years named:

EXPORTS OF BATH—UNMANUFACTURED WOOD.

Year.	Sawed lumber.		Shingles.		Shooks.	All other unm'f'd.
	Feet.	Value.	Quantity.	Value.	Value.	Value.
1856	1,713,000	$21,331	58,000	$ 88	.....	$56,042
1857	935,000	11,489	.....	.....	.....	33,782
1858	1,675,000	19,787	195,000	280	.....	33,559
1859	1,740,000	21,040	585,000	808	.....	11,798
1860	940,000	10,440	40,000	100	.....	.....
1861	546,000	6,290	.....	.....	.....	.....
1865	948,000	21,450	464,000	2,398	.....	.....
1867	452,000	9,395	.....	.....	$12,892	757
1868	3,000	60	.....	.....	.....	.....
1869	286,000	6,201	6,000	9	111,200	.....
1870	107,000	1,684	7,000	23	4,554	3
1871	452,000	8,345	.....	.....	15,266	.....
1872	676,000	13,507	.....	.....	138,943	.....
1873	1,134,000	21,571	3,000	5	161,502	1,214
1874	499,000	10,196	.....	.....	139,497	.....
1875	272,000	4,954	29,000	57	155,832	466
1876	4,315,000	52,643	.....	.....	141,915	497
1877	5,017,000	56,676	70,000	140	111,259	1,965
1878	2,607,000	23,990	.....	.....	.....	1,214
1879	511,000	5,240	.....	.....	.....	.....
1880	.....	.....	.....	.....	.....	344
1883	.....	.....	.....	.....	1,582	79
1885	50,000	825	.....	.....	.....	.....
1887	4,000	49	50,000	125	.....	17
1888	.....	.....	150,000	313	240	120
1890	9,000	187	.....	.....	.....	402
1892	18,000	258	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	25
1900	340,000	4,620	.....	.....	.....	.....
1903	.....	.....	.....	.....	.....	150

[1]Includes staves and headings.

The following exports of manufactures of lumber, including furniture, hogsheads and barrels, woodenware, etc., from Bath are on record:

EXPORTS OF BATH—MANUFACTURES OF LUMBER.

1856	$ 1,083	1869	$ 5	1878	$100
1857	1.104	1870	415	1879	343
1858	3,143	1871	1,009	1888	29
1859	20.035	1872	7,385	1893	372
1860	13,257	1873	1,867	1894	416
1861	8,192	1874	2,136	1902	186
1865	8,306	1875	2,163	1903	22
1867	121	1876	2,220		
1868	108	1877	53		

The exports of Machias, including unmanufactured and manufactured lumber, are shown in the following table:

EXPORTS OF MACHIAS.

Year.	Sawed lumber.		Shingles.		All other unmanufactured.	All manufactured.
	Quantity, feet.	Value.	Quantity, pieces.	Value.	Value.	Value.
1856	3,681,000	$43,442	259,000	$ 624	$ 501	$ 710
1857	7,491,000	61,761	294,000	731	200	1,223
1858	10,666,000	128,850	533,000	1,300	300	.....
1859	7,906,000	97,308	509,000	1,279	149	2,760
1860	8,235,000	101,704	638,000	1,631	120	.....
1861	6,216,000	77,585	283,000	653	281	316
1865	7,279,000	173,709	581,000	2,649	1,344	116
1867	11,490,000	228,532	1,675,000	6,712	838	1,726
1868	8,999,000	166,723	1,179,000	4,855	436	.....
1869	6,964,000	133,062	1,152,000	5,103	87	62
1870	5,514,000	102,718	1,097,000	5,120	.....	.....
1871	7,118,000	129,499	948,000	4,042	280	39
1872	8,884,000	169,195	1,143,000	5,358	86	263
1873	6,335,000	125,297	505,000	2,567	34	1,026
1874	5,026,000	99,012	136,000	555	.....	15
1875	7,387,000	124,896	298,000	887	.....	28
1876	6,353,000	98,950	89,000	200	51	39
1877	6,131,000	93,609	235,000	738	141	.....
1878	2,114,000	29,188	100,000	300	140	.....
1879	5,141,000	66,514	163,000	449	198	300
1880	6,961,000	91,182	318,000	938	145	105
1881	2,036,000	29,136	291,000	775	.....	1,200
1882	4,966,000	76,269	542,000	1,502	.....	33
1883	4,337,000	67,234	165,000	531	.....	279
1884	4,522,000	68,497	315,000	623	.....	300
1885	3,772,000	52,543	190,000	372	217	368
1886	5,481,000	70,266	404,000	1,034	25	131
1887	2,934,000	39,292	.....	.....	263	.....
1888	2,864,000	40,894	332,000	704	11	15
1889	3,892,000	56,602	400,000	848	126	48
1890	3,135,000	45,250	608,000	1,281	32	100
1891	2,508,000	35,609	703,000	1,389	1,165	102
1892	2,824,000	40,830	200,000	484	14	.....
1893	1,340,000	20,467	506,000	935	53	199
1894	2,365,000	36,029	422,000	879	176	.....
1895	958,000	13,821	799,000	1,472	62	91
1896	652,000	9,797	120,000	225	.....	.....
1897	139,000	1,840	.....	.....	.....	.....
1898	133,000	1,827	.....	.....	4	.....
1899	137,000	1,746	.....	.....	.....	.....
1900	973,000	13,316	451,000	840	75	14
1901	925,000	4,666	.....	.....	.....	.....
1902	466,000	7,462	.....	.....	.....	.....
1903	430,000	6,840	.....	.....	.....	.....
1904	283,000	4,698	.....	.....	.....	.....
1905	264,000	5,274	.....	.....	.....	.....

Machias is interesting chiefly because of its antiquity in the lumber business rather than because of any late importance. As will be seen from the above table, during the last fifty years its exportations, as previous thereto, were almost exclusively of sawed lumber and shingles, the

city never having developed manufactures of lumber to an extent worthy of especial mention. Drawing its log supply from a comparatively limited territory, it has not maintained the volume of its business or of its exports as has Bangor.

Eastport is the shipping port for the custom house district of Passamaquoddy, the export figures of which are given in the next succeeding table as follows:

EXPORTS OF PASSAMAQUODDY (PORT, EASTPORT).

Year.	Unmanufactured.					Manufactured.	
	Boards, deals, planks.		Shingles.		All other unmanufactured.	Furniture.	All other manufactures.
	Feet	Value.	Pieces.	Value.	Value.	Value.	Value.
1856	3,485,000	$36,241	844,000	$1,416	$4,692	$32,577	$19,258
1857	2,294,000	26,195	914,000	1,799	1,014	15,753	14,060
1858	2,106,000	22,650	731,000	1,150	4,220	10,606	16,377
1859	2,065,000	20,445	1,588,000	2,438	2,210	17,637	17,745
1860	3,861,000	36,178	557,000	1,059	3,478	14,429	17,612
1861	12,014,000	105,466	318,000	391	3,225	14,783	41,311
1862	.....	.....	.....	.....	301,198	10,379	4,620
1863	.....	.....	.....	.....	84,627	14,736	5,427
1864	3,866,000	40,290	.....	.....	7,045	17,665	27,440
1865	1,405,000	32,106	.....	.....	29,310	24,076	13,579
1867	1,539,000	21,525	1,215,000	2,630	2,330	33,493	24,744
1868	3,421,000	34,896	999,000	3,018	2,135	12,959	23,776
1869	160,000	3,255	.....	.....	1,406	6,581	35,907
1870	.....	.....	.....	.....	3,348	.....	19,050
1871	17,000	1,450	.....	.....	526	8,790	14,977
1872	29,000	2,284	.....	.....	.....	19,337	32,389
1873	2,103,000	37,038	58,000	200	230	25,537	35,134
1874	1559,000	10,140	192,000	718	1,206	37,154	27,260
1875	13,051,000	39,167	21,000	47	194	30,129	30,134
1876	18,019,000	93,832	112,000	256	72	15,953	19,777
1877	17,019,000	78,838	80,000	170	462	22,858	17,503
1878	12,986,000	34,106	.....	.....	.....	88,603	42,393
1879	13,362,000	38,064	50,000	100	.....	21,579	15,034
1880	12,719,000	34,130	220,000	560	194	4,167	9,484
1881	12,677,000	35,824	200,000	400	565	4,212	7,888
1882	12,412,000	32,689	50,000	100	72	3,572	9,588
1883	14,029,000	57,083	680,000	2,003	213	6,204	11,655
1884	14,871,000	68,071	700,000	1,973	123	5,074	8,891
1885	3,936,000	51,712	795,000	2,212	1,118	4,979	6,870
1886	13,479,000	41,824	815,000	1,943	457	3,160	3,530
1887	14,080,000	49,558	.....	.....	111	4,661	4,247
1888	5,663,000	72,401	.....	.....	916	5,384	3,237
1889	119,000	8,245	.....	.....	434	623	5,168
1890	646,000	11,506	.....	.....	.....	1,644	3,689
1891	677,000	13,053	.....	.....	7,786	2,024	7,969
1892	2,120,000	27,578	240,000	1,035	748	294	1,149
1893	2,713,000	34,326	854,000	961	6,069	3,678	1,765
1894	1,178,000	14,584	853,000	768	6,953	2,550	1,287
1895	121,000	1,580	892,000	892	42	534	1,639
1896	673,000	9,374	1,599,000	1,760	22,950	6,198	494
1897	1,205,000	15,123	2,272,000	2,806	23,836	692	1,193
1898	262,000	2,873	1,828,000	1,828	16,967	1,341	1,015
1899	421,000	4,391	3,088,000	2,684	4,304	659	1,987
1900	398,000	5,544	.....	.....	28,824	2,044	3,186
1901	675,000	9,497	175,000	305	18,031	200	649
1902	30,000	839	.....	.....	18,812	.....	1,467
1903	110,000	7,674	.....	.....	18,276	2,077	1,564
1904	116,000	6,553	.....	.....	7,875	1,617	3,846
1905	136,000	6,399	.....	.....	23,065	1,470	3,887

[1] Includes joists and scantling.

Under the heading, "Exports of the Minor Ports of Maine," is given the value of exports of all the remaining custom house districts of the State. Among these Belfast has the largest showing in sawed lumber, and the year in which the greatest amount by far was exported was 1865 when

7,570,000 feet, valued at $161,689, was shipped from that port. The table is as follows:

EXPORTS OF THE MINOR PORTS OF MAINE.

Name of District.	Unmanufactured.		Manufactured.	
	Sawed, lumber value.	All other unmanufactured, value.	Cabinet ware and furniture, value.	All other manufactures, value.
Aroostook	.....	$ 5,297	.....	$ 133
Belfast	$517,394	132,266	.....	96,671
Castine	51,433	126,379	$422	52,075
Frenchman Bay (port, Ellsworth)	72,420	156,024	82	21,932
Kennebunk	2,996	11,413	.....	1,727
Penobscot	139,135	91,615	.....	48,197
Saco	802	278	.....	11,544
Waldoboro	8,970	26,394	618	1,860
Wiscasset	310,479	371,018	.....	129,530

Maine's imports form a less important item in that State's lumber history than do the exports, only two ports, Bangor and Portland, being deemed of sufficient importance to be given separate tables. The figures of the imports of Bangor are as follows:

IMPORTS OF BANGOR.

Year.	Unmanufactured.					Manufactured.
	Sawed lumber.		Shingles.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1869	.....	.....	.....	.....	.....	[1]$13,541
1870	.....	.....	.....	.....	.....	[1]5,731
1871	.....	.....	.....	.....	$ 450	.....
1872	.....	.....	95,000	$ 234	.....	.....
1873	.....	.....	2,767,000	5,823	.....	.....
1874	.....	.....	1,407,000	2,815	.....	.....
1875	.....	.....	450,000	840	.....	.....
1876	.....	.....	.....	.....	.....	5
1877	.....	.....	.....	.....	2,582	.....
1878	.....	.....	.....	.....	.....	15
1881	53,000	$ 437	1,099,000	2,102	4,257	1,084
1882	28,000	286	2,998,000	7,060	23,104	9,421
1883	94,000	633	5,848,000	13,009	23,892	4,196
1884	129,000	1,204	4,980,000	10,976	42,857	1,365
1885	120,000	1,375	11,139,000	23,359	31,886	1,265
1886	78,000	645	17,597,000	37,867	29,867	1,174
1887	475,000	3,903	16,930,000	34,946	28,811	1,828
1888	638,000	4,842	14,131,000	31,576	34,788	3,945
1889	366,000	2,451	30,709,000	67,604	42,170	5,101
1890	446,000	3,651	39,996,000	82,762	64,844	4,348
1891	789,000	5,952	47,265,000	101,817	66,019	22,427
1892	1,047,000	7,970	54,865,000	116,853	35,783	32,954
1893	1,358,000	9,064	58,327,000	123,663	56,696	41,624
1894	1,651,000	10,202	41,962,000	81,060	9,810	32,105
1895	1,926,000	15,753	4,892,000	11,063	176,811	28,995
1896	4,700,000	37,211	.....	.....	198,561	13,863
1897	4,298,000	31,297	.....	.....	200,604	53,167
1898	1,739,000	9,893	25,519,000	48,178	52,328	55,187
1899	918,000	5,334	23,898,000	47,595	27,739	62,597
1900	1,498,000	10,691	41,247,000	85,594	44,059	379,936
1901	1,489,000	12,589	62,169,000	121,548	22,504	280,716
1902	3,504,000	29,121	75,317,000	151,500	32,706	277,011
1903	2,104,000	18,752	77,589,000	165,932	48,068	317,553
1904	1,357,000	12,893	64,710,000	134,664	47,143	459,181
1905	5,439,000	53,269	62,962,000	136,074	73,463	208,674

[1]All woods and manufactures of woods except cabinet wood.

Portland's imports cover a longer period of time than Bangor's, according to the records of the Government, the figures being as follows:

IMPORTS OF PORTLAND.

Year.	Unmanufactured.						Manufactured.	
	Cabinet woods.	Sawed lumber.		Shingles.		All other unmanufactured.	Cabinet ware and furniture.	All manufactures.
	Value.	Feet.	Value.	Pieces.	Value	Value	Value	Value
1856	.....	.....	.....	.....	.....	$ 37	$ 36	$ 587
1857	$ 405	.....	.....	.....	.....	7	.....	49
1858	.....	.....	.....	.....	.....	.....	.....	152
1862	.....	.....	.....	.....	.....	.....	.....	16
1863	2,334	.....	.....	.....	.....	.....	1,712	24
1864	.....	.....	.....	.....	.....	.....	2,506	.....
1865	.....	.....	.....	.....	.....	.....	791	.....
1868	41	2,157,000	$21,744	.....	.....	17,804	44,286	.....
1869	.....	.....	.....	.....	.....	.....	.....	[1]92,571
1870	.....	.....	.....	.....	.....	.....	.....	[1]54,818
1871	.....	940,000	7,531	.....	$ 1,841	1,593	80,040	.....
1872	.....	941,000	7,639	1,278,000	2,615	716	[2]36,781	.....
1873	19,523	1,205,000	16,086	689,000	1,801	.....	[2]50,364	.....
1874	35,569	1,014,000	11,509	189,000	542	.....	[2]39,765	.....
1875	11,648	1,059,000	20,252	114,000	176	.....	[2]22,419	.....
1876	9,978	195,000	3,103	6,000	12	.....	[2]12,557	.....
1877	6,781	1,982,000	17,657	182,000	374	.....	[2]9,814	.....
1878	12,670	3,197,000	38,746	1,105,000	1,712	.....	[2]7,887	.....
1879	7,396	2,145,000	25,093	723,000	1,203	.....	[2]10,197	.....
1880	9,733	1,828,000	20,640	599,000	1,086	597	212,378	.....
1881	14,240	707,000	9,158	176,000	360	.....	28,373	.....
1882	32,566	312,000	2,503	.....	.....	3,857	26,627	.....
1883	36,202	442,000	4,871	1,155,000	1,746	6,780	21,166	.....
1884	32,133	263,000	2,625	1,249,000	2,014	7,375	.....	.....
1885	16,179	146,000	1,133	560,000	1,226	3,599	.....	4,833
1886	20,166	109,000	1,272	984,000	2,307	5,142	.....	587
1887	11,869	3,129,000	27,918	438,000	894	5,831	80	580
1888	31,987	1,320,000	13,125	528,000	1,056	2,601	.....	2.136
1889	19,494	6,152,000	58,570	725,000	1,225	3,748	.....	1.921
1890	6,274	5,030,000	43,092	515,000	733	3,451	.....	893
1891	11,530	3,339,000	28,591	3,000	5	13,111	.....	4.322
1892	3,687	3,101,000	25,183	1,500,000	2,400	24,348	.....	537
1893	3,294	3,654,000	26,147	.....	.....	19.864	22	49
1894	2,387	3,549,000	27,445	.....	.....	8,371	.....	17
1895	.....	1,348,000	10,977	.....	.....	9,641	.....	5.624
1896	75	753,000	8,507	[3]	.....	7,032	29	13.439
1897	.....	2,057,000	20,380	[3]	.....	13,873	144	551
1898	.....	1,155,000	10,345	1,828,000	2.757	.....	.....	65
1899	.....	695,000	6,950	1,050,000	1,418	157	.....	20
1900	.....	787,000	7,790	1,002,000	2,005	.....	46	10,612
1901	.....	998,000	9,322	28,000	56	200	1.504	89
1902	2,947	1,403,000	14,290	272,000	545	.....	7,484	1,212
1903	.....	1,007,000	10,121	923,000	1,691	.....	.....	550
1904	15,870	614,000	6,330	.....	.....	7.627	5	4.931
1905	3,839	174,000	2,400	100,000	200	27.238	139	90

[1]Includes all woods and manufactures of wood except cabinet wood
[2]Includes all manufactures of wood.
[3]Dropped from list.

With no lumber product of importance directly tributary to it by water, Portland is in a position similar to that of Boston in respect to lumber importations. If trade conditions favor, it may, as in the past, receive occasional cargoes of forest products from the Maritime Provinces of Canada, while its direct lines of communication with foreign countries lead to importations, at intervals, of cabinet woods and manufactures of wood.

All of the remaining ports are classified as minor ports, in reference to imports. Among them Passamaquoddy, port of Eastport, has the largest figures, 16,689,000 feet of boards, planks and deals, valued at $148,213, being imported there in 1895, and 13,238,000 feet, valued at $115,444, in 1896. The figures for all of the other years fall below the 10,000,000 mark in quantity. The table of the imports of the minor ports is as follows:

IMPORTS OF THE MINOR PORTS OF MAINE.

Name of District.	Unmanufactured.		Manufactured.	
	Sawed lumber, value.	All other unmanufactured, value.	Cabinet ware and furniture, value.	All other manufactures, value.
Aroostook	$ 47,351	$ 609,999	$16,177	$ 70,491
Belfast	5,143	28,485	260	10,930
Bath	12,964	162,560	1,322	9,348
Castine	2,261	27,958	1,474	4,079
Frenchman Bay (port, Ellsworth)	1,795	1,363	.....	255
Kennebunk	948	157	225	247
Machias	34,377	42,306	32	5,229
Passamaquoddy (port, Eastport)	1,165,343	1,296,538	.....	355,726
Saco	.....	6	.....	360
Waldoboro	10,625	970,098	.....	4,053
Wiscasset	1,072	11,185	.....	.....
York	.....	130	.....	.....

In this history of the lumber industry of Maine, reference has been made to the provision of the Ashburton Treaty of 1842, by which timber, the property of American citizens, cut in Maine upon the waters of the St. John and the St. Croix rivers and their tributaries may be sawn or hewn in the Province of New Brunswick in mills owned by American citizens and brought into the United States free of duty. Perhaps this place is as appropriate as any in which to state the magnitude of this business. In some years it has been of great importance and in many years has run over 100,000,000 feet of lumber. The smallest importation of sawed lumber was 23,806,000 feet in 1890 and the largest 413,824,000 in 1872. The sudden and marked fluctuations that are shown are due to several conditions. A large production of such mills may be coincident with a small foreign demand and an active demand in the United States, in which case the importations would be heavy; on the other hand, a year of small product might be coincident with a sluggish American market and an active foreign one, in which case lumber would largely go abroad. It will be noted that the years 1895, 1896 and 1897 are omitted. This is because the tariff act of 1894 made all lumber free and Maine lumber could not be distinguished from other lumber during the three succeeding fiscal years, as it was not shown separately during that period. The records of the Treasury Department show that the importations of forest products for the years 1869 and 1905, inclusive, with the exceptions named, are as follows:

FREE IMPORTATIONS OF PRODUCTS OF MAINE FORESTS FROM NEW BRUNSWICK.

YEAR.	Sawed lumber.		Lath, palings, pickets, etc.		Shingles.		Logs, masts and other round timber.	All other.[1]
	Feet.	Value.	Pieces.	Value.	Pieces.	Value.	Value.	Value.
1869	58,344,000	$ 648,487	39,674,000	$55,480	78,076,000	$222,574	. .....	$18,673
1870	68,850,000	780,398	48,526,000	72,445	60,152,000	183,808	$ 1,042	14,767
1871	157,205,000	641,710	50,235,000	72,033	44,524,000	127,625	12,837	17,828
1872	413,824,000	685,589	317,447,000	61,729	34,577,000	96,957	30,802	11,079
1873	69,300,000	100,077	60,242,000	82,311	42,820,000	120,745	5,791	44,334
1874	42,456,000	401,318	54,834,000	68,893	44,275,000	125,167	49,594	75,396
1875	44,765,000	478,705	46,499,000	60,088	28,981,000	79,666	64,418	1,762
1876	30,811,000	321,506	36,826,000	41,670	23,123,000	58,748	8,700	9,890
1877	33,870,000	314,752	43,772,000	46,707	26,471,000	54,530	43,908	4,628
1878	25,689,000	235,211	39,997,000	47,388	15,713,000	31,391	14,394	4,076
1879	42,813,000	356,751	38,822,000	43,063	20,942,000	40,022	48,441	3,199
1880	76,542,000	692,834	52,210,000	61,598	31,116,000	63,348	20,424	3,721
1881	118,115,000	562,274	51,171,000	63,818	31,972,000	60,985	70,414	8,139
1882	64,954,000	675,782	73,417,000	94,638	29,753,000	60,631	116,200	14,412
1883	71,825,000	735,586	81,156,000	110,424	22,230,000	47,981	24,323	8,784
1884	85,600,000	864,900	88,120,000	150,086	23,102,000	48,247	83,155	9,752
1885	85,530,000	884,302	76,553,000	126,512	34,620,000	69,803	88,800	7,977
1886	250,779,000	1,062,328	98,341,000	160,803	36,059,000	72,935	18,318	14,721
1887	102,628,000	1,049,705	78,459,000	125,233	43,754,000	90,746	58,240	10,107
1888	107,513,000	1,109,663	81,928,000	125,814	71,436,000	155,438	22,989	50,961
1889	103,921,000	1,076,160	89,801,000	134,744	79,173,000	166,051	. .....	25,570
1890	23,806,000	247,108	15,610,000	21,844	27,454,000	57,773	. .....	6,978
1891	122,729,000	1,328,497	100,980,000	153,270	114,398,000	242,209	402	23,522
1892	104,144,000	1,045,349	79,468,000	124,902	120,807,000	254,967	1,706	21,168
1893	117,567,000	1,230,276	97,017,000	163,592	122,750,000	270,755	.....	37,940
1894	96,261,000	937,920	87,273,000	128,486	124,989,000	238,812	.....	26,682
1898	48,694,000	486,985	56,734,000	65,366	76,614,000	142,914	.....	5,995
1899	75,275,000	745,163	63,852,000	73,334	97,379,000	183,295	.....	9,028
1900	45,244,000	523,974	42,865,000	68,187	107,685,000	210,518	.....	6,760
1901	47,896,000	532,770	39,007,000	68,305	114,869,000	224,078	.....	6,402
1902	62,397,000	737,754	48,073,000	101,612	114,648,000	223,366	.....	12,640
1903	33,457,000	444,886	27,838,000	58,578	85,243,000	175,498	.....	7,784
1904	30,034,000	399,074	26,037,000	57,135	54,287,000	109,011	.....	1,357
1905	40,495,000	566,365	28,665,000	62,781	75,331,000	149,737	.....	3,477

[1]Includes all other lumber, sawed and hewn timber, all other timber, and shooks, staves and heading.

CHAPTER X.

NEW HAMPSHIRE.

Only three years after the landing of the Pilgrim Fathers at Plymouth a small settlement was established at Portsmouth on the short coast line of what is now New Hampshire. It is said that Captain John Smith, of Virginia, was the first one to explore the beautiful harbor at the mouth of the Piscataqua River. The harbor itself, its commanding location and the surrounding forests pointed it out as an inviting place for settlement.

One David Thompson, of Plymouth, England, with a small party, arrived at the port in the spring of 1623, with the intention of beginning a settlement. On a slight eminence at Odiorne's Point he built a stone house, traces of whose foundation remained for two centuries. It is not absolutely certain that the settlement was not abandoned for a time, but it is believed that it was continuous from that date, although in 1631 there were but three houses in the vicinity. Some historians have it that part of the expedition went up the river and settled at Dover.

Edward E. Sanborn, in his "History of New Hampshire from Its Discovery," says the first sawmill in New England operated by water power was probably built by the New Hampshire colonists on the Salmon Falls River at a place near "Newichewannock," in 1631. Provisions were also made for a grist mill at about the same time by the proprietors of New Hampshire. From this time mills were rapidly multiplied in the colonies, both for sawing and grinding, and in the shipbuilding region at Portsmouth the sawmills far outnumbered the flour mills. Other historians make it seem probable that this first sawmill was not in the present New Hampshire, but across the river in Maine, for "Newichewannock" was in the present town of South Berwick, Maine. But, however that may be, early in its history Portsmouth became an extensive shipper of timber and timber products.

In Portsmouth itself it is certain there was no sawmill until after 1653. In that year the inhabitants of the town, until then called "Strawberry Bank," asked the General Court at Boston to grant the settlement a township and also to change the name of the place to Portsmouth. Evidently the desire for a defined township allotment was based upon the needs of the inhabitants for land for farming and stock raising and also for a supply of timber, for the petitioners set forth that "Whereas there is

much benefit by sawmills in other towns in this river and adjacent towns there is none in this town."

The first record of a sawmill in Portsmouth is found in the "Annals of Portsmouth," wherein it is stated that on February 1, 1659, the selectmen "granted to Mr. John Cutt the liberty to set up a sawmill and corn mill on the creek leading up to the fresh marsh." He had the privilege of cutting timber on the commons for the sawmill, was to grind the corn for the town at all times when required, and was allowed a term of five years for the erection of the mills. They were built according to the grant.

This settlement was within the boundaries of the grant made to Mason and Gorges in 1622, of the land lying on the coast between the Merrimac and Kennebec rivers, extending sixty miles into the country. This grant was later divided, as is elsewhere recounted, Mason securing that part lying between the Merrimac and the Piscataqua rivers; and its boundaries were extended until it covered all of the present State of New Hampshire, with claims of indefinite extent beyond. The interest of the Mason heirs was not extinguished until 1691.

The government of New Hampshire was changed several times. Sometimes it was independent, either as a whole or as separate towns; sometimes under the government of the Massachusetts Bay Colony, represented by the General Court at Boston, and sometimes under a Governor or Lieutenant Governor appointed by the King. For many years before the Revolution, however, it was self-governing, the laws made by the people being subject to revision by the Governors and Lieutenant Governors appointed by the King.

Three other settlements shortly followed that of Portsmouth. They were Dover, which was practically contemporaneous with Portsmouth, Exeter and Hampton, the last two settled in 1638, and all located in the extreme southeastern part of the State in what is now Rockingham County, with the exception of Dover, which is in Strafford County. All were accessible by water to the small vessels of the time. They occupied the interesting position of independent democracies up to 1643, when they became constituent parts of the Massachusetts Bay Colony; but in 1679 heirs of Captain John Mason succeeded in securing the establishment of these towns into a separate province, of which John Cutt, referred to above, was the first "president."

While settlement on the short coast line of New Hampshire was made at an early date, it was many years before the tide of settlement extended far from navigable waters. While Exeter and Hampton were settled in 1638, further settlement in Rockingham County seems to have been deferred until after the beginning of the Eighteenth Century.

Londonderry was settled in 1719 and was originally called Nutfield, as recorded in Coolidge and Mansfield's "History of New England," because of the abundance of chestnut, butternut and walnut trees which distinguished the growth of its forests. Hampstead Township was settled in 1728, Atkinson and Nottingham at about the same time, while a number of towns were not settled until after 1750.

Strafford County, next north of Rockingham County, and bounded on the east by the Salmon Falls River, was first settled at Dover in 1623. It is said that in addition to the original purpose of the settlement, which was fishing, trade with the Indians and the manufacture of lumber soon followed. In 1640, or a little earlier, Richard Walderne, whose descendants bear the name of Waldron, built a sawmill and soon after a grist mill in the heart of the present city of Dover. For a half century his house was a frontier trading post.

Durham Township, adjoining Dover on the south, was settled only a few years later and in 1649 the falls in Oyster River were granted to Valentine Hill and Thomas Beard "for the erickting and setting up of a sawe-mill." This mill was built before 1651. Mr. Hill was given "free liberty to cutt through our comans for drawinge part of the water of Lamperelle River into Oyster River."

Somersworth Township was first settled in 1630, but for the most part settlement was deferred until after the middle of the Eighteenth Century. The town of Washington was first occupied in 1768 and the following year a grist mill and a sawmill were erected.

The two counties of Rockingham and Strafford seem to have been the only ones in which settlement was begun prior to 1700, except for one settlement in Cheshire County.

Hillsborough County adjoins Rockingham on the west. One of its first settlements was in the town of Hudson in 1710. In regard to Goffstown, in this county, it is said that large quantities of lumber were formerly floated down the "Piscataquog" River to the Merrimac, and its forests at one time supplied masts for the English navy.

Cheshire, the southwestern county of the State, early attracted settlers who came in by way of the Connecticut River. Hinsdale, just over the line from Massachusetts, was settled in 1683, but the occupation of this county progressed slowly until about 1750.

One of the first settlements in Merrimac County was at Boscawen, in 1734. Five years later a sawmill and grist mill were erected and a ferry established across the Merrimac River. The town of Warner, in Merrimac County, was first granted by the Governor of Massachusetts Bay in 1735 to petitioners of Amesbury and Salisbury, Massachusetts. These proprietors made several efforts at settlement and in 1749 erected

four houses and a sawmill; but the French war intervened, the improvements were destroyed by the Indians and so the first permanent settlement in this town was not made until 1762.

Immigration followed the water courses and finally, by 1765, reached Coos County, in the extreme northern part of the State.

So slow was the settlement of the State that by 1790 its population was only 141,885, and this population was chiefly in the southern quarter of the State and in the towns that had sprung up along the chief streams, though it should be said that its population at that time exceeded that of Maine, whose settlement to that period had been almost entirely of lumbermen, located particularly on the coast, and fishermen.

The great timber county of the State is Coos. It exceeds any other in area, and the configuration of its surface and its soil were particularly adapted to tree growth. The upper Androscoggin describes a rough semicircle in the eastern part of the county, while its western border is the Connecticut River, and its whole area is intersected by streams, many of which are capable of floating logs. It has been, therefore, the county of special interest to lumbermen since the time when the exhaustion of pine nearer the sea led them to follow the streams toward their sources.

Along its streams white pine was very abundant and as late as 1850 there were still some of the original forests of this wood remaining; but since that time spruce has been the chief timber and furnished the basis for one of the largest lumbering operations in New England, that of the Berlin Mills Company whose operations are more particularly treated of in connection with Portland, Maine. In addition to white pine and spruce, birch, beech, rock maple and larch were among the prevailing trees.

EARLY TIMBER CONDITIONS.

The original forests in New Hampshire were much diversified as to species and nowhere were there very large bodies of pure stands. This was due to the broken character of the country which, within a comparatively small area, would introduce soils, exposures and climates suitable to different species. There were river valleys, swamps, upland plateaus, mountain sides and mountain tops, all in close juxtaposition. But classified by the two coniferous species, white pine and spruce, the forest growth might be somewhat definitely outlined. In the southeastern part of the State, between the Salmon Falls and the Merrimac rivers, reaching ten or fifteen miles west of the latter stream, and extending northward to the White Mountain region, was a white pine section in which that wood was the predominating one. Another white pine belt was along the western border of the State, extending from the Connecticut River east for from ten to twenty miles and reaching from the Massachusetts line north to the middle of Coos County.

There were also white pine areas in Carroll County in the eastern part of the State, one around Ossipee Lake and the other bordering the Saco River. There was a considerable body also in the northern part of Coos County, around the Connecticut Lakes.

The spruce region occupied the entire remaining part of the State, but growing heaviest from the northern boundary south to the southern limits of the Presidential Range in Carroll County. In this section there were extensive areas of almost pure spruce forests, though everywhere it was broken up, more or less, by other coniferous woods and the hardwoods, the latter being especially prominent, both in the pine and spruce areas, in the southern part of the State.

Between the eastern and western pine belts, occupying the water shed between the Connecticut and the Merrimac, was a belt of spruce intermixed with hardwoods.

Practically the entire area of the State, river bottom lands, swamps and all, was timbered, the only marked exception being a few of the higher summits of mountains, the treeline ranging from 3,000 to 4,000 feet, while rising still higher were dwarfed specimens of coniferous trees, which were usually recumbent on the ground as if shrinking from the forbidding climate.

At the present time spruce is the only timber that is found in any considerable quantity in its virgin condition. The entire southern part of the State has been cut away, but there are remnants of the original forests in the central and northern parts, while the second growth timber, in both pine and spruce, furnishes the basis for a considerable industry. The second growth pine that is most valuable follows, in the main, the outlines of the original pine territory, though in the southeastern part reproduction has been retarded by the relatively dense settlement of that section.

Notwithstanding its ruggedness, New Hampshire has always been a favorite state with the loggers on account of the many streams which, though rapid and with rocky beds, penetrate its fastnesses. Thus the Piscataqua and its tributaries, notably the Salmon Falls River, are the scene of what was probably the first river driving operation in America. The Merrimac was also an important stream in early colonial days. The Androscoggin and the Saco, of Maine, have part of their course in New Hampshire, and so when the lower regions of those rivers were exhausted of timber by the lumbermen of Maine, they followed up their channels into New Hampshire. The Connecticut, extending almost the entire length of the western border, with the Connecticut Lakes in the extreme northern part of the State as its source, has for one hundred and fifty years been utilized by the logger, and even in this Twentieth

NEW HAMPSHIRE SPRUCE

NEARLY PURE, OLD STAND. ON A HIGH BENCH NEAR NORTH WOODSTOCK

Century brings down annually many millions of feet of logs. But the Merrimac, Saco, Androscoggin and Connecticut all flow out of the State into other commonwealths, so that the timber of New Hampshire has been quite largely cut beyond its borders.

Of the woods that were earliest exploited and which gave the greatest value to the forest, was the white pine. It grew to magnificent proportions and of fine quality, probably equal in every particular to the finest pines of Michigan or Wisconsin, but the broken nature of the country allowed room for no such extensive stand of white pine timber as in states of more uniform surface. The early settlers have left records of pines which they declared were over 200 feet tall, and one 270 feet in height was cut on what is now the grounds of Dartmouth College.

It was the pine, together with the white oak, which built up, in early colonial days, the great timber and lumber shipping trade of Portsmouth. The pines were shipped in the whole tree for masts or spars or cut into lumber and planks or rived into clapboards, while the oak supplied an enormous demand for pipe and hogshead staves from the wine countries and from the West Indies.

Though called the "Granite State" and rugged in the extreme, New Hampshire's harsher features were everywhere veiled by this wonderful arboreal growth, except where some precipice allowed no foothold to the trees or where the higher mountain tops thrust themselves above the tree-line. Early explorers and travelers have left many records of the way in which they were impressed by the natural features of the State.

An exploring expedition bound for Laconia, a vaguely defined concession of early colonial times, but which extended to Lake Champlain and the St. Lawrence River, visited the White Mountains. This was in 1632, and of the country beyond those mountains to the north they said it was "daunting terrible, full of rocky hills as thick as mole hills in a meadow, crowded with infinite thick woods."

Two and a quarter centuries later, in 1853, Barstow's "History of New Hampshire" was published. Then New Hampshire was an old state, but nature had reserved most of its area from settlement or modern improvement. A portion of the description therein given of the natural features of the State may be quoted to advantage:

> Proceeding north from Orford, where the intervales are narrow, the traveler enters a broad and fertile valley at Haverhill, which is spotted by villages, watered by abundant streams, and surrounded by picturesque hills, swelling into mountains along the eastern horizon, and rising to lofty heights at the south and west. The route to Moosehillock from Haverhill leads by Owl's Head, an abrupt mountain, which presents its bald and rugged face at the roadside which winds along the Oliverian. The somber green foliage of the black alder fringes this wild stream, mingled with sprightlier leaves of the birch, maple and white ash, with here and there a willow or a slender mountain ash. From

this stream a rude footpath has been cleared, which winds up the mountainside. Your approach to the summit becomes visible by the diminishing size of the trees, and by their naked, dead and gnarled aspect. They are pine, spruce and fir—the only one that retains its greenness is the mountain ash, which seems to flourish at an elevation where all others die. . . . Emerging at last from a forest of small firs the summit of the mountain rises before you, bearing no forest trees, but bare and seemingly composed of ledges and loose blocks of granite. . . . From the summit of this mountain, which is elevated 4,636 feet above the level of the sea, far to the eastward a vast expanse of forest stretches away over hills thickly covered with hemlock and spruce to the purple island of Lake Winnipiseogee, which is distinctly visible. . . . When the frosts of autumn have given to the woods those varied hues which constitute the peculiar charm of the American forest scenery, this valley presents a picture, of many miles in extent, where, in the many colored woods, the red, yellow and russet brown are interspersed and blended in those rich and diverse shades which, as they are never seen in Europe, are the wonder of European travelers.

Another route to the mountains is from Lancaster. . . . Boughs of tamarac and spruce overhang the road. Pondcherry Mountain stands on the right and Pliny Mountain walls up the left; both clad in deep green foliage to their utmost heights. . .

Previous to the survey of Doctor Jackson, the scenery at the extreme north of the State was little known. Its striking features were observed by him. . . . Indian Stream is a small settlement near the falls at the outlet of the Connecticut Lake. It is the most northerly inhabitated place in New Hampshire, and comprises, in the whole, a colony of 315 persons, scattered on the undulating shores of the lake. . . . In 1841 Doctor Jackson explored Camel's Rump Mountain, at some distance from the village. . . . He found it covered with a low and tangled undergrowth, with stunted fir-balsams and spruce. The view from its summit is one of surpassing interest and grandeur. Northward stretches the lofty range of the hills which divides Magalloway and Connecticut; and beyond these the broad prairies or tablelands of Canada. Southward are seen Umbagog Lake and the Diamond hills, with the numerous waters in their vicinity and far beyond them the lofty heights of the White Mountains; westward are the lake and tributary streams of the Connecticut and along the horizon's verge the Green Mountains. Eastward the view is bounded by the granite peaks of Maine.

A more detailed account of the forest growth of this State will be found in the following excerpt from a report by F. B. Hough, agent of the Department of Agriculture, in "Report on Forestry," published by the department in 1884:

The native forests were especially heavy and dense on the lowlands near the coast, when the country was first explored by Europeans, and pines of gigantic size flourished along the fertile intervales of the rivers and streams. The characteristic timber of the southern part consisted of the white pine, white oak, chestnut, white elm, white and black ash, basswood, walnut, white maple, hemlock, red oak, laurel, etc., following somewhat regularly the contour lines of elevation as the several species found conditions favoring their growth.

Towards the north the sugar and striped maples, beech, balsam fir, spruces, and northern white cedar or arborvitæ, became the prevailing kinds. The white spruce does not exist to great extent south of Connecticut Lake in the extreme northern part, but further northward in Canada it becomes more important than the black spruce. The latter is at present the principal timber tree of the Upper Connecticut Valley, in Vermont, New Hampshire, and the adjacent Province of Quebec.

The "white cedar" (*Thuja occidentalis*) is chiefly found in upland swamps, and in certain regions it grows very densely and abundantly but not to a large size. It may be said generally that throughout the State the deciduous species preferred the dry and fertile uplands, while the conifers occupied the swamps and the mountain ravines. Along the coast the pitch pine and the red cedar were the characteristic trees, the former preferring a sandy and the latter a stony soil, neither of them extending far inland and neither being of much commercial account. The "norway pine" (*Pinus resinosa*) was more important but less abundant, occurring in clumps in the middle and southern parts of the State.

A chapter on the distribution of plants in New Hampshire, by William F. Flint, published in the geological survey[1] of the State, in 1874, gives some account of the forest trees and their distribution, from which the following notes are condensed:

The whole State was originally covered with a dense forest growth, the principal kinds of timber being pines, spruces, oaks, and hickories, beech, chestnut, white, red, and sugar maples, butternut, birches, elm, white and black ashes, basswood, and poplars. A striking contrast is shown in the aspect of the northern and southern portions of the State, caused by differences of temperature due to altitude, the transition being gradual, some species becoming scarce and finally disappearing, while others, first appearing in small numbers, increase as we go north or south until they may become the prevailing kinds. A few species occur throughout the entire State. A line drawn from North Conway to Lake Winnipiseogee, and from thence to Hanover, would somewhat distinctly divide the northern from the more southern types. This transition area would be at an elevation of about 600 feet above tide, corresponding with the annual mean of 45 degrees, or of 20 degrees in winter and 65 degrees in the summer months.

Among the species characteristic of the more southern type which here find their northern limit may be mentioned the chestnut, white oak, spoon-wood or mountain laurel, and frost-grape. The range of pines and walnuts, of white or river maple, red oak and hemlock, is also mainly southern.

The more characteristic trees of the northern class are the sugar maple, beech, balsam-fir, black and white spruces, and arborvitæ, and of the smaller trees the mountain ash and striped maple. Of these the white spruce and arborvitæ have the most limited range. The former is abundant about Connecticut Lake, but occurs rarely if at all, south of Colebrook. The latter (*Thuja occidentalis*) is also common in this section, extending south to the vicinity of the White Mountains, and is also occasionally found in highland swamps farther south.

The pine family forms the most important feature of the landscape, and has been an important source of wealth to the State. The white pine originally filled all the river valleys with a heavy growth, extending along that of the Connecticut to the northern boundary. This growth has now nearly disappeared before the lumberman's ax, but the great abundance of saplings in the southern part of the State shows that this species is still the principal conifer of that section. Passing northward into Coos County, we find the white pine much restricted in area, occurring mostly at the headwaters of the streams, and mainly confined to the first growth specimens, saplings being of rare occurrence, even where the land is allowed to return to forest after clearing.

The pitch and red pines are of more limited range, the former (*Pinus rigida*) occurring most along the sandy plains and drift knolls of the river valleys, scarcely growing on

[1] Geological Survey of New Hampshire, 1874, Vol. I, p. 381.

hills that attain much elevation above the sea level. It is found most abundantly in the southeastern part of the State, and in the Merrimack Valley and around Lakes Winnipiseogee and Ossipee, extending northward as far as North Conway. In the Connecticut Valley it appears less abundantly. The red pine (*P. resinosa*), often called "norway pine," "is the most social of the pine genus," occurring in groups of from a few individuals to groves containing several acres. Although much less common, its range is about the same as that of the pitch pine, probably attaining a higher elevation above the sea level. This species is of handsome and rapid growth, and is well worthy of being planted for ornament.

In the White Mountain region the balsam fir and black spruce grow together in about equal numbers, giving to the scenery one of its peculiar features. They are the last of the arborescent vegetation to yield to the increased cold and fierce winds of the higher summits. North of these mountains, the arborvitæ forms the predominant evergreen mingled with the white spruce about Connecticut Lake. In the southern part they are mostly confined to the highlands between the Merrimack and Connecticut rivers, the black spruce being most abundant.

The hemlock is common in the southern part of the State, ranging most abundantly around the base of the rocky mountains, southward along the highlands, becoming less near the coast. Its northern limit is in the vicinity of Colebrook and Umbagog Lake, reaching an elevation of 1,200 feet above the tide.

The tamarack does not enter largely into the flora of New Hampshire, being chiefly found in swamps of small extent, and ranges along the highlands from Massachusetts to north of the White Mountains. The red cedar is chiefly limited to the seashore. The juniper is sometimes troublesome by overspreading hilly pastures. The American yew is often present in cold-land swamps.

The maples are best represented among deciduous trees. The river maple is most limited in range, being confined to intervales of the principal streams, and rarely far away from them. The red maple is common in all parts of the State, and the sugar-maple is abundant, filling an important part in the economy of the State, supplying both timber and sugar. It is common in most parts, but less toward the seacoast. This, with the beech, makes up the greater part of the hardwoods of Coos County. Southward the beech is common on high lands only, often growing with spruce and hemlock.

Four species of birch are common, of which the black, yellow, and canoe birches have about the same range as red maple. The canoe or paper birch grows high up the sides of mountains. The fourth and smallest, the white birch, is most abundant in the southeast part of the State, affording the "gray-birch hoop-poles" used in the manufacture of fish-barrels.

Five or six species of oak are found, of which the hardiest is the red oak. Although the only species found along the water-shed between the Merrimack and Connecticut, it does not extend much beyond the White Mountains, having its upper limit at about 1,000 feet above the sea. The white and yellow oaks usually appear together, on the plains and hillsides along the rivers. The former extends northward in the Connecticut Valley nearly to the mouth of the Passumpsic, in the Merrimack Valley to Plymouth, and in the eastern part of the State to the vicinity of Ossipee Lake. Its limit in altitude is about 500 feet above the sea, which is also very nearly that of the frost-grape. The barren or shrub-oak is abundant on the pine plains of the Lower Merrimack Valley, thence extending eastward to the coast, and to the sandy plains of Madison and Conway. The chestnut oak seems to be local in this State; at Amherst and West Ossipee it can be found abundantly.

The chestnut is found in the same situations as the white oak, but is first to reach its limit of altitude, which is about 400 feet above the sea. It occurs in a few localities about Lake Winnipiseogee at a somewhat greater height, the neighborhood of the lake producing less severity of temperature than in the river valleys at the same altitude.

The American elm attains probably the largest size of any deciduous tree. It grows best in alluvial soil, and is the most extensively planted for shade and ornament of all trees, unless, perhaps, the sugar-maple.

Butternuts also prefer the borders of streams, and in the valley of the Pemegewasset extend northward to the base of the mountains. Hickories are most common in the Lower Merrimack Valley, the shellbark extending northward to the vicinity of Lake Winnipiseogee. Basswood is found mostly on the highlands, but is not very common. The black cherry is found throughout the State, usually most common near streams. Two species of poplar are common; the first a small tree, very common in light soil, and often springing in great abundance where woodland is cleared away. The other, the black poplar, may be a large tree.

EARLY TIMBER REGULATIONS.

In Chapter I of this volume an account is given of the early timber regulations, both by the Crown, the Colonial government and by local authority. The prominence of the place early taken by the Granite State is indicated by the fact that most of those regulations had to do especially with New Hampshire. In 1639, at Exeter, the Court decreed "that no man shall set fire upon the woods to the destroying of the feed for the cattle or the doing of any other hurt under pain of paying the damage that shall issue thereby;" and during the succeeding year the following was promulgated: "It is ordered and agreed upon by the inhabitants of the town of Exeter, that none shall fell any Oke timber within half a mile of this part of the town, except it be upon their planting lott, or for building or fences, upon the penalty of each tree 5 shillings."

In 1668, in ordering the settlement of the boundaries of Exeter, the General Court provided that all pine trees fit for masts that were twenty-four inches or more in diameter, three feet from the ground, and that grew more than three miles from the Exeter meeting house within the bounds of the town, should be reserved for the public, and that if any one should fell any such pine trees fit for masts the penalty of £10 for each tree should attach. In fact, the Crown claimed its pick of all the forests, and, in the words of Elliott, in his "History of New England," "No persons but his officers were allowed to cut the grand pine trees which covered the hillsides and crowned her mountain tops." This condition created many conflicts between the people and the representative of the Crown. Concerning this, Elliott says: "The people were free and there was no standing army in New Hampshire to shoot them down and the 'loggers and raftsmen' took the liberty which the King claimed as a divine right. They asserted a 'Swamp Law' and cut their share. They per-

sistently resisted Governor Cranfield's high-handed plans for taxing and governing them; and he at last begged to be allowed to remove from these unreasonable people;" but the claims of the Government to these resources were not abandoned.

The natural resources in lumber and naval stores, as leading products of New Hampshire, attracted the attention, not only of the colonies but of the mother country. In King William's reign a surveyor of the woods was appointed by the Crown and an order was sent to the Governor General to cause acts to be passed in the several governments for the preservation of the white pines.

In 1708 the early regulation was increased in severity and a New Hampshire statute prohibited the cutting of trees that were twenty-four inches in diameter at twelve inches from the ground, without leave of a surveyor, who was instructed to mark with the broad arrow those which were fit for the use of the navy and to keep a register of them, but whatever severity might be used in the execution of the law it was no difficult matter for those familiar with the country to evade it, although sometimes they were detected and fined. Frequent complaints were made of the destruction of the royal woods and every Governor and Lieutenant Governor had occasion to declaim on the subject in their speeches and letters, and their faithfulness in this matter recommended them to their superiors in England as careful guardians of the royal interests. On the other hand, the people made as loud complaints against the surveyor for prohibiting the cutting of pine trees and yet neglecting to mark such as were fit for masts; by which means many trees which never could be used as masts, and might be cut into logs for sawing were rotting in the woods, or the persons who cut them were exposed to a vexatious prosecution. When no surveyor was on the ground the Governor and Council appointed suitable persons to take care that no waste should be made of mast trees; and these local officers performed the duty to much better effect than those who were sent from England and were unfamiliar with the country.

As those trees which grew within the limits of the townships were deemed private property, there was anxiety to secure the laying out of other townships that the trees might be secured for the people's use, but this was a difficult point.

In 1704 the Assembly, during the controversy with Allen, explicitly disclaimed a title to the waste lands, by which they understood all those within the bounds of their towns. In some parts of the Province were many pitch pine trees unfit for masts but capable of yielding tar and turpentine. A monopoly of this manufacture had been attempted by a company of merchants, but when many thousand trees were prepared for use they were destroyed by unknown hands. Afterward a law was

made providing that tar should be received in lieu of the taxes at twenty shillings a barrel. This encouraged the making of it, but another law laid a penalty on the injuring of the trees by the turpentining process. Private interest thus conflicted with public utility. Too many incisions being made in the tree at once, they were soon destroyed, and, those in available locations becoming scarce, the manufacture was gradually discontinued.

In 1639 the town of Hampton appointed three men called "woods wards" who had charge of the woods and assigned each family what it could cut.

In 1709 Hampton voted that no man should fell on the common any pine to be hewed and sent out of town under a penalty of ten shillings for each tree and if any were found they should be forfeited, and half the value go to the informer and half to the town.

The development of the export business in lumber from New Hampshire was so rapid that the subject of proper manufacture soon came to be one of importance and perhaps the first enactment regarding the quality of the lumber manufactured was made in New Hampshire in 1683. This enactment, which is found on page 468 of the "Provincial Papers of New Hampshire," was as follows:

> By the Governor and Council.
>
> Whereas frequent complaints are made by the Merchants, inhabitants of Jamaica, Barbadoes, and Leeward Islands, and other of his Majesty's plantations, to which pine boards are exported from this said Province, of the unreasonable thinness and uneven and wavy edge of the boards, which, unremedied, may prove of great detriment to the trade of the Province, and loss of that trade: It is, therefore, hereby ordered, that from henceforth no pine boards shall be accounted merchantable or delivered in payment, that are not full inch in thickness, and square edge. And if any boards go out otherwise, such allowance shall be made unto the buyer or receiver thereof as shall be adjudged reasonable by a sworn surveyor or collector, to be appointed for that purpose.
>
> Dated this 4th of October in the 35th year of the reign of our sovereign lord, King Charles the Second, A. D. 1683.

It is evident from the above that the trade of the New England colonies, and especially of New Hampshire, with the West Indies had by that time become of importance and that to maintain that trade on a satisfactory basis it was necessary by means of a sworn surveyor to control the manufacture and make sure of the lumber being properly sawed. It is probable that was the first authority for the appointment of an official lumber inspector, but whether or not it was the first, it was not the last, for today in various parts of the country, surveyors of logs and lumber are state officials.

Some records have been left as to the early trade of New Hampshire. In 1717 the goods exported from the Colony of New Hampshire included

206 tons of deals and pipe staves and ten shiploads of masts. Masts, boards, planks and pipe staves and timber for all purposes were exported in large quantities to the Barbados and other West Indian ports.

A record made in 1800 at Shelburne, on the Androscoggin River, is as follows: "For some years clearing land and raising food was the principal industry. The richest and straightest trees were reserved for the frames of the new houses; shingles were rived from the clearest pine; baskets, chair bottoms, cattle bows, etc., were made from brown ash butts; all the rest of the timber cleared was piled and burned on the spot. Logging was always a standard industry, and the timber holds out like the widow's meal and oil. All the pine went first. Nothing else was fit for building purposes in those days. Tables were made 2½ feet wide from a single board, without knot or blemish."

Prior to the Revolution the commerce of Portsmouth, compared with other commercial towns in New England, was of much greater relative importance than at the present time, but it was practically annihilated by the Revolutionary War, and at its close, in 1783, it had not a single square rigged vessel in a seaworthy condition. The recovery of its commerce from the general ruin was gradual. The breaking out of the general war in Europe gave the American trade the advantage of neutrality, business again quickened to life and Portsmouth shared largely in the general prosperity until the Embargo in 1807. Following its repeal in 1809, was another brief season of prosperity until the War of 1812 again swept American commerce from the ocean, and thereafter the direct foreign trade of Portsmouth never recovered its former vigor, in fact dwindled until now it is of very limited proportions.

We have spoken of the early uses of pine and oak. Not only were these woods exported for shipbuilding purposes, but a large shipbuilding industry was built up at Portsmouth, to which the oak, pine and larch (hackmatack) contributed.

In colonial times vessels of 200 to 300 tons were built every year at Portsmouth and vicinity. This industry, during the times of wooden ships, advanced or declined with the changes in the shipping trade of Portsmouth. After the War of 1812, Portsmouth district shipbuilding amounted to comparatively little, although, during the central decades of the last century, the industry was one of considerable magnitude.

The following shows the number and tonnage of vessels built at Portsmouth during the several fiscal years from 1844 to 1879, inclusive. The last named year was the last one of record in which vessels were built at that port. This table does not include the operations of the Portsmouth Navy Yard, which is located upon an island adjacent to the harbor but within the State of Maine.

VESSELS BUILT AT PORTSMOUTH, NEW HAMPSHIRE.[2]

Fiscal years ended in	Number.	Tonnage.	Fiscal years ended in	Number.	Tonnage.
1844	3	754.88	1862	1	189.76
1845	5	2,501.08	1863	2	563.50
1846	8	2,171.08	1864	5	3,510.88
1847	10	5,288.48	1865	4	824.43
1848	9	5,326.33	1866	14	4,024.57
1849	12	6,265.89	1867	2	1,529.45
1850	10	6,914.32	1868	13	5,549.47
1851	7	8,158.06	1869	1	69.43
1852	14	9,815.22	1870	4	2,486.86
1853	10	8,666.11	1871	3	1,207.83
1854	11	11,980.12	1872	0	.....
1855	11	8,928.24	1873	1	378.75
1856	10	10,395.08	1874	3	3,182.88
1857	9	8,718.19	1875	2	1,585.12
1858	6	5,075.77	1876	5	1,702.59
1859	6	3,846.41	1877	8	94.22
1860	5	3,808.03	1878	4	2,972.82
1861	10	4,605.43	1879	2	518.65

Notwithstanding the prominence of Portsmouth as a lumber exporting point in early colonial times, the War of 1812, as stated above, almost extinguished that portion of its business. The records in the Government archives at Washington, so far as available, go back only to 1856. But since that time only twelve years show any exports whatever of wood or manufactures of wood. The following table contains the summaries for these years. The items are few and scattered. Under sawed timber but one item was given—181,000 feet in 1904. Boards, planks and deals were reported for only three years and totaled but $116,000. Shingles were reported one year to the quantity of 110,000 pieces. Furniture was the principal item making up the totals under the head of manufactures of wood. The table is as follows:

WOOD EXPORTS OF PORTSMOUTH.

Year.	All unmanufactured lumber, value.	All manufactures of lumber, value.
1856	.....	$ 112
1857	.....	4
1858	.....	10
1859	$1,576	410
1861	.....	3,210
1863	150	440
1864	.....	41
1865	295	14
1867	1,703	21
1870	.....	18
1871	.....	25
1872	7	74

The imports of Portsmouth make a better showing than the exports. In this table cabinet woods form the principal item, returns being given for this branch of the industry from 1873 to 1894, inclusive. Boards and other sawed lumber were reported for seventeen years to the amount of 2,330,000 feet; shingles, seven years, amounting to 4,710,000; logs and round timber, but two years, value $1,232; hewn timber, one year, value $4,118. In manufactures of lumber, cabinet wares and house finish make up the principal import. Following is the table:

[2] "Report on Forestry," p. 351. Published in 1884.

IMPORTS OF PORTSMOUTH.

Year.	All cabinet woods, value.	All other unmanufactured, value.	All manufactured, value.
1862	.....	.....	$ 793
1863	.....	.....	2,332
1868	.....	$ 1,897	.....
1869	.....	.....	689
1870	.....	.....	2,725
1871	.....	4,118	23
1872	.....	2,360	.....
1873	$ 4,924	.....	.....
1874	3,413	.....	.....
1875	12,850	.....	43
1876	4,824	.....	.....
1877	5,548	292	.....
1878	4,510	.....	.....
1879	3,368	.....	55
1880	4,210	117	10
1881	2,446	353	.....
1882	18,882	23	.....
1883	8,318	.....	.....
1884	7,521	392	.....
1885	14,066	94	8
1886	29,173	950	.....
1887	27,526	396	.....
1888	34,101	138	.....
1889	28,077	.....	.....
1890	13,149	.....	.....
1891	11,082	1,924	40
1892	6,192	1,072	10
1893	3,025	2,252	.....
1894	3,854	.....	74
1895	.....	11,084	.....
1896	.....	23,082	.....
1897	.....	22,452	.....
1898	.....	6,509	5
1899	.....	7,674	.....
1900	.....	1,296	.....
1901	.....	874	.....
1902	.....	2,997	.....
1903	.....	2,557	.....
1905	.....	.....	420

In the above, the column headed "All other unmanufactured" contains small quantities of sawed lumber received in sundry years, but until 1896 the quantity never exceeded 100,000 feet and the highest importation was in 1897, amounting to 686,000 feet valued at $6,372. Portsmouth is the only port of New Hampshire.

THE STATE'S PRESENT LUMBER RESOURCES.

As the sawmill followed so close upon settlement it is evident that in New Hampshire, as in the other New England states, the lumber business was early of importance. It was necessary in local development, but owing to the abundant logging streams in New Hampshire and its excellent harbor at Portsmouth, it was the first to gain prominence as a shipper of forest products; in fact, in that State, timber development preceded agriculture; and masts, clapboards and other articles of wood were being shipped from the Piscataqua when grain had to be brought in from Boston. It remains to this time a State important for its lumber production, when its area is taken in to consideration, and, next to Maine, is today the most important timber producer of the New England commonwealths.

New Hampshire was at the beginning densely forested. With a

total land area of 9,056 square miles, or 5,795,840 acres, it is estimated that at least 9,000 square miles were originally covered with timber and that about fifty-five percent of its area is still wooded. This is due to the rugged and mountainous character of its topography, to which also is due the variety in its forest wealth.

Of a selected list of trees of commercial importance, native to the eastern states, New Hampshire is the home of eleven species of coniferous trees and of thirty species of the broad-leaf trees, while many other species have a scanty representation. Its forests were substantially identical with those of Maine on the east and Vermont on the west. Of the selected list the identical number in both coniferous and broad-leaf species was found in Maine and New Hampshire, though Vermont is credited with three more broad-leaf species—species which attain their best development in the Appalachians, barely reaching Vermont and western Massachusetts in their eastward distribution.

The rough character of central and northern New Hampshire resulted in the preservation of the pine much longer than in any of the adjoining states. As late as 1883 Maine and Michigan lumbermen bought a tract of 47,000 acres which was estimated to cut 250,000,000 feet of pine and spruce, about an equal amount of each. This was virgin timber, but at the present time the original growth of pine has practically been extinguished though still there remain some virgin forests of spruce which are the basis of extensive logging operations. The pine product of New Hampshire today is almost exclusively of second growth timber known as saplings or box pine, inferior in quality to the original growth and also in size. This inferiority being due, however, to the manner of its growth and its immature age.

The twelfth census gives the New Hampshire cut of pine as 307,131,000 feet. The leading lumbermen and state officials say that these statistics were grossly inaccurate. The spruce cut, which, so far as the general market is concerned, greatly exceeds that of the pine, was given as only 185,422,000 feet.

George H. Moses, of Concord, secretary of the New Hampshire State Forestry Commission, says, "The annual cut of spruce timber in New Hampshire is far in excess of the pine, the United States census to the contrary notwithstanding. The cut of spruce is upward of 400,000,000 annually, while the pine is scarcely a quarter of that, even including all that the Diamond Match Company uses." It can hardly be doubted that the census report was wide of the mark, and yet it should be remembered that of the 535 sawmills reported by the census, only a few entered into the calculations of the lumber trade. Most of them cut for local consumption or shipped small quantities of waney-edged lumber, chiefly for the

use of box makers in New Hampshire and adjoining states. If there were 400 mills cutting an average of only 500,000 feet a year each, their total production would amount to 200,000,000 feet. Doubtless in New Hampshire, as elsewhere, the ordinary lumber trade statistician ignores the small producers, which, in the aggregate, constitute an important element in the lumber production.

The manufacturing census of 1905, the results of which are given on a succeeding page, reinforces the claim made by the census of 1900 that the pine lumber product of New Hampshire is larger than the spruce output. It reported the white pine product of 1904, excluding custom mills, to have been 306,631,000 feet and the spruce sawed lumber product to have been 109,822,000 feet. It seems hardly possible that with no purpose to serve by a misstatement of facts the Government census takers would have been so consistently mistaken in two enumerations as would be inferred from the statement of Mr. Moses quoted above. When it is remembered that the census report quoted concerns the sawmill product only, while Mr. Moses referred to the cut of spruce timber, a partial explanation of the difference is secured. Probably the spruce timber is largely cut for pulp so that Mr. Moses' statement that the annual cut of spruce timber in New Hampshire is far in excess of the pine might be conceded to be true without thereby denying the correctness of the census reports as to pine lumber production. Further, it may be noted that much of the spruce timber cut in the State is manufactured into lumber elsewhere.

The pine lumber product of the small mills is a feature peculiar to the trade of New England. Second growth pine, sometimes known as sapling or box pine, and in Maine as ladder pine, is seldom more than fifty years old and so has not had a chance to shed its branches and cover the scars with new and smooth wood, hence the lumber is more or less knotty. It is, however, suitable for box manufacture and much of it goes into industries which require wood in only small pieces. Most of the country mills, are, at this time, equipped with merely a circular saw, so that the lumber is neither edged nor trimmed. The logs are sawn "through and through" or "live." As it is almost invariably used for cutting-up purposes, this seems to be no disadvantage and, in fact, the claim is made that it works to better advantage than if it were edged and trimmed.

Referring more particularly to the distribution of the woods of New Hampshire, C. G. Pringle, who studied the forests of Carroll County and vicinity, says[3] regarding the situation about 1880:

> The forests and the mountain sides between Crawford's and Bartlett are composed principally of yellow birch and paper birch, the sugar maple, the red maple, poplar, the black spruce and the balsam fir. About Bartlett scattering specimens of the white

[3] "The Forests of North America," Part III, page 497. C. S. Sargent, Washington, D. C., 1884.

pine make their appearance. In the more level part of North Conway the red and the pitch pine and the hemlock become common, while on the more sterile, sandy plains farther down the Saco these pines with the white birch constitute the principal arborescent growth.

The tract known as Hart's location, lying partly in the White Mountain notch, includes 10,000 acres, 2,000 of which bear 15,000 feet per acre of spruce and hemlock—rather more of hemlock than of spruce; 10,000 acres in this tract will cut twenty-five cords of hardwood per acre. The town of Bartlett, partly cleared, still has 40,000 acres of woodland, which will yield an average of 5,000 feet per acre of spruce and hemlock and fifteen cords of hardwood. Sargent's grant covers Mount Crawford, Stair Mountain, and a part of Mount Washington. On this tract are 15,000 acres of timber land carrying 20,000 feet per acre, chiefly spruce. The Thompson and Meserve purchase comprises portions of mounts Washington, Jefferson and Madison, and covers 12,000 acres. Two thousand acres of this will yield 30,000 feet of spruce and hemlock per acre in nearly equal proportions; the remaining 10,000 acres will cut twenty-five cords of hardwood per acre. The Bean purchase lies north of the town of Jackson and covers 40,000 acres. It is occupied by a dense forest amounting to 20,000 feet of spruce and hemlock and twenty cords of hardwood per acre. Originally there was considerable pine on the streams and sides of the mountains in this vicinity, particularly on Mount Kearsarge, but now there is little left.

In 1880 nine-tenths of Coos County was reported covered with forests, and regarding it Mr. Pringle said:

Everything east of the Connecticut Lakes and about the upper portions of Indian and Perry streams is original forest. Such also is the condition of the Gilmanton, Atkinson, and Dartmouth College grants and the towns of Dixville, Odell and Kilkenny. All the eastern portions of Clarksville, Stewartstown, Colebrook, Columbia and Stratford are forest, and nearly all of Wentworth's location, Millsfield, Errol, Dummer, Cambridge, and Success. In these forests the spruce will cut 5,000 feet and the hardwood about fifty cords per acre. There is considerable hemlock, but even less pine than in Essex County, Vermont. Not much of the region has been burned over, and spruce comes into the soil again but slowly after clearings and fires.

In the township of Kilkenny, in the mountains east of Lancaster, there are 16,000 acres of forest still untouched, though a branch railroad from Lancaster into this forest has been surveyed, and may be constructed in a few years, for the purpose of bringing the lumber down to the mills at Lancaster. Lowe and Burbank's grant is a wilderness, three-fourths well timbered and the remainder a mountain ridge of nearly bare rock. Bean's purchase is nearly inaccessible and but little lumbered. Stark, on the upper Ammonoosuc, is badly cut over, only about one-quarter remaining in virgin forest. About one-half of Berlin is uncut; also the northern half of Randolph, the south half of Gorham, and the south quarter of Shelburne. Considerable land in Success was burned over some years ago, as well as some in Stark and in the eastern part of Berlin, but fires have not lately been very destructive in the New Hampshire forests.

In the winter of 1903 the State Legislature of New Hampshire appropriated $5,000 for an examination and study by the Bureau of Forestry at Washington, of the northern part of the State—that portion which lies north of Squam Lake, east of the low lying agricultural lands along the Connecticut River, which portion contains 32 percent of the total area of the State, is still almost entirely forest covered and for the most part

will always be more valuable for forest growth than agriculture. According to records of the Bureau the region studied constitutes two classes, which differ considerably both in general character and in forest growth. The southern of these is the White Mountain region, which contains approximately 812,000 acres. It is very rough and rugged, with numerous broken mountain ranges intersected by deep, narrow valleys, with steep slopes, rapid streams, and all the conditions which invite soil erosion and permanent denudation of forest growth on the higher slopes, if careful lumbering is not practiced and fire is not kept out. In the extreme southern part of this region second-growth white pine forms a valuable part of the forest on the lower lands, but spruce is in general the leading commercial species. Before lumbering began spruce was much more common than now, and the effect of present methods is still further to decrease its representation and to substitute for it the hardwoods, which are usually of much lower commercial value.

Until 1869 the greater part of the White Mountain region was owned by the State. Since then the State has sold large and small tracts at nominal prices, until today all the forest land is in private ownership, most of it held by large lumber and pulp companies. These companies are making formidable inroads upon the forests. Seven companies own nearly all the timber land, and three of them cut annually about 75,000,000 board feet, mostly from virgin forests. It is a hopeful sign that two of these companies have adopted the policy of conservative lumbering.

Of the total area examined, approximately 2,000,000 acres, 989,592 are covered with softwoods, 34,752 with pine, 45,112 with hardwoods, and 244,036 acres are agricultural lands; the remainder is made up of burned, waste and barren land, and lakes and streams. The virgin merchantable forests comprise but 200,000 acres, while there are 1,363,711 acres of cut-over or culled land and 120,495 acres of barren and waste land. The present stand of softwoods is computed to be 4,764,000,000 board feet and the annual cut is 249,639,000 feet. In 1900 the wooded area of the entire State was 3,228,000 acres and the cut of lumber amounted to 570,357,000 board feet. This is equivalent to 177 board feet an acre of wooded area, and is more intensive lumbering than in any of the big timber states, Wisconsin being next, with 175 board feet an acre.

In relative importance in New Hampshire the lumber industry stands third, the paper industry fifth. From July 1, 1902, to June 30, 1903, the total amount of wood cut in the northern part of the State amounted to 273,562,000 board feet, of which 82.5 percent, or 225,747,000 board feet, was spruce. In the same year the paper and pulp mills used 109,041 cords of native spruce and 87,859 cords of Canadian spruce. The pulp companies are each year importing spruce in order to save their home for-

"CATHEDRAL AISLE"

CARROLL COUNTY, NEW HAMPSHIRE. SECOND GROWTH WHITE PINE IN WHITE MOUNTAINS

ests as much as possible, and, by cutting them conservatively, to secure a continuous crop through natural reproduction. Lumber companies have not been as conservative; in many cases clean cutting has ruled.

LUMBER STATISTICS.

The following table is a comparison of the principal items making up the census reports, for the years 1850 to 1900, inclusive:

COMPARATIVE LUMBER STATISTICS, 1850-1900—NEW HAMPSHIRE.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments	545	567	723	680	570	553
Capital	$859,305	$1,185,126	$2,428,193	$3,745,790	$7,592,167	$11,382,114
Number of wage-earners	969	1,195	3,398	3,104	5,370	6,382
Wages	$265,068	$341,160	$725,304	$548,556	$1,600,993	$2,383,074
Cost of materials used	$622,564	$702,111	$2,471,427	$2,272,991	$2,607,473	$3,496,425
Value of products	$1,099,492	$1,293,706	$4,286,142	$3,842,012	$5,641,445	$9,218,310

[1] Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

The next table shows the quantity and value of all the products of the forest, as given in the twelfth census, including rough lumber, shingles, cooperage materials, all other sawed products, timber camp products and planing mill products, giving a total for the forest products of New Hampshire of $8,949,917 in value. The figures in detail are as follows:

FOREST PRODUCTS OF NEW HAMPSHIRE—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
White pine	307,131,000	$3,278,893
Hemlock	45,115,000	482,865
Spruce	185,422,000	2,201,118
Cypress	1,000,000	30,000
Norway pine	80,000	920
All other conifers	42,000	575
Total, conifers	538,790,000	$5,994,371
HARDWOODS:		
Ash	1,248,000	$ 20,316
Birch	2,639,000	33,564
Chestnut	3,430,000	52,080
Basswood	162,000	1,568
Oak	12,606,000	234,595
Poplar	90,000	1,000
Maple	2,438,000	32,840
Other hardwoods	855,000	11,595
Total, hardwoods	23,468,000	$387,558
Total, rough lumber	562,258,000	$6,381,929

SHINGLES.

	Quantity, pieces.	Value.
White pine	16,468,000	$33,225
Cedar	5,229,000	11,076
Hemlock	2,212,000	4,011
Spruce	15,915,000	26,081
Other conifers	675,000	1,024
Total, shingles	40,499,000	$75,417

COOPERAGE MATERIALS.

	Quantity.	Value.
Staves, pieces	8,419,000	$34,120
Headings, sets	318,000	5,040
Total, cooperage materials	.....	$39,160

FOREST PRODUCTS OF NEW HAMPSHIRE—CENSUS OF 1900.—Continued.

OTHER SAWED PRODUCTS.

	Quantity.	Value.
Bobbin and spool stock, feet b. m.	7,689,000	$113,976
Furniture stock, feet b. m.	1,475,000	25,836
Agricultural implement stock, feet b. m.	30,000	1,100
Carriage and wagon stock, feet b. m.	475,000	9,950
Pickets and palings, feet b. m.	190,000	1,920
Lath, pieces	74,221,000	155,491
All other sawed products	.....	553,593
Total, other sawed products	.....	$861,866

TIMBER CAMP PRODUCTS.

Cooperage stock, cords	13,000	$61,200
Excelsior stock, cords	205	720
Fence posts, pieces	36,150	2,560
Hewed timber, feet b. m.	25,000	200
Logs cut for export, feet b. m.	150,000	1,800
Logs cut for domestic sale, feet b. m.	109,513,000	680,113
Handle stock, cords	35	215
Hemlock bark, cords	4,202	21,835
Piles, pieces	3,820	16,900
Railway ties, pieces	107,962	29,443
Rived or shaved shingles, pieces	100,000	200
Masts and spars, pieces	31	305
Telegraph poles, pieces	2,275	5,325
Charcoal, bushels	77,000	4,700
All other products	.....	190,306
Amount received for contract work	.....	52,171
Total, timber camp products	.....	$1,067,993
Total, planing mill products	$1,423,563	
Less value of lumber used	900,011	$523,552
Grand total, value forest products	.....	$8,949,917

A comparison of the principal items making up the lumber census, also of the quantity and value of the chief varieties of rough lumber, for the years 1900 and 1905 is presented below. The disagreement between the figures for 1900 and the figures for the same year in another table is accounted for by the fact that in 1905 the custom mills were not taken into account, and, in order to make the comparison perfect, these mills were deducted from the 1900 figures also, in this table. This comparative summary is as follows:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—NEW HAMPSHIRE.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	397	[1]386
Capital	$7,129,509	[1]$6,079,442
Salaried officials, clerks, etc.:		
Number	140	[1]82
Salaries	$104,587	[1]$80,660
Wage-earners:		
Average number	7,502	[1]4,594
Wages	$2,652,694	[1]$2,017,131
Miscellaneous expenses	$597,669	$1,274,885
Cost of material used[2]	$3,422,470	[1]$3,358,785
Value of products[2]	$9,023,574	[1]$8,060,545
Quantity, Value and Principal Varieties of Rough Lumber:		
White pine:		
Thousand feet b. m.	290,867	306,631
Value	$3,117 355	$3,803,183
Hemlock:		
Thousand feet b. m.	40,741	36,074
Value	$440,131	$422,855
Spruce:		
Thousand feet b. m.	181,653	109,822
Value	$2,161,183	$1,638,043

[1]Decrease.

[2]Includes a duplication—the value of rough lumber, which in 1905 amounted to $541,114, remanufactured in planing mills connected with sawmills producing it.

Birch:		
Thousand feet b. m.	2,173	5,522
Value	$27,570	$74,800
Oak:		
Thousand feet b. m.	12,083	13,685
Value	$228,437	$204,535
Maple:		
Thousand feet b. m.	2,202	5,730
Value	$29,680	$74,762
Chestnut:		
Thousand feet b. m.	3,265	4,055
Value	$50,635	$58,138
All other:		
Thousand feet b. m.	12,618	10,072
Value	$206,784	$139,030
Total quantity, thousand feet b. m.	545,602	491,591
Total value	$6,261,775	$6,415,346

CHAPTER XI.

VERMONT—DEVELOPMENT.

Vermont was originally forest covered, and its rounded, tree-clad mountain slopes gave occasion for the exclamation of Champlain when he first saw them from the waters of the lake that bears his name: "*Voila les verts monts*"—"Behold the green mountains." Tradition has it that from these words, abbreviated first to Verdmont, and then still further abbreviated by the omission of the "d", was derived the name of the State. Translated, this term was applied to the chief mountain range of the State, and ever since a time before the Revolution has been a favorite appellation. The Green Mountain Boys was the name of an organization formed to resist the claims of New York to grants made by New Hampshire, and during the Revolution it was applied to the soldiers who represented that region in war with the mother country.

The clothing of green which covered what is now Vermont was remarkable in variety and value. The most important of the woods was the white pine (*Pinus strobus*), but covering the greater extent was the spruce, which was intermixed with hemlock and larch, of which genera only the spruce remains at this time an important article of commerce. In addition to the conifers were numerous species of hardwoods, the most important of which was the sugar maple. Much of this timber, notably maple, birch and beech, still remains, but, as a whole, the State has been pretty well denuded of its hardwoods. A "History of the State of Vermont" (1831), by Nathan Hoskins, says:

> The forests which had for centuries been maturing, were regarded as an incumbrance, rather than estimated for their value. Thus by gradual improvements and cultivations of the lands Vermont has been stripped of her native grandeur. The white pine, the greatest ornament of this and probably of any forest on the American continent, is principally destroyed. It was often found six feet in diameter and 250 feet in height, with a beautiful foliage, perfectly suited to the stem which it adorns. The oak, so highly valuable for strength and durability of its timber, remains but in small quantities, and those mostly in such situations as discovery has not reached or neglect has preserved. The sugar maple, affording a luxury from its saccharine juices, and great convenience in its timber and fuel, has been so diminished by the progress of cultivation, that groves of this majestic and valuable tree, once overspreading a large proportion of the State, are now found only on unfeasible or mountainous lands. A similar destruction has been made of many other valuable species of trees, some of which are entirely extirpated. The different situations and qualities of land peculiar to the growth of different kinds of forest trees range in this order: The intervales

along the large rivers were formerly timbered with oak, butternut, elm and walnut. The plain lands were generally covered with pine. On the medium land the timber was usually beech, birch and maple, often intermixed with spruce, hemlock, ash, elm, bass, butternut, cherry and hornbeam. In some parts of the State are swamps which afford a plentiful supply of cedar. The sides and tops of the mountains are covered with evergreens, mostly hemlock, spruce and fir.

FOREST TREES OF VERMONT.

Zadock Thompson, in his "History of Vermont," published in 1842, gave a list of the forest trees native to Vermont and their distribution. From this list the following principal trees are quoted:

Basswood, or lime tree—In all parts of the State.

Sugar maple—One of the most common and valuable forest trees of Vermont.

White maple—(Distribution not given.)

Red maple—In most parts of the State.

Red ash—(Distribution not given.)

Black ash—(Distribution not given.)

Red beech—Found in all parts of the State

White beech—(Distribution not given.)

Large white birch, or canoe birch—Is quite common.

Black, or cherry birch, or sweet birch—Is not so abundant as the yellow birch.

Yellow birch—Common in all parts of the State.

Buttonwood, or sycamore—(Distribution not given.)

White elm—Is found, though not very plentifully, in all parts of the State.

Red, or slippery elm—Though found in most parts of the State, is less abundant than white elm.

Butternut—Is common in most parts of the State.

Shellbark hickory—Is by no means uncommon, particularly in the neighborhood of Lake Champlain.

Norway pine, or red pine, or yellow pine—Though originally plentiful in some places in Vermont, was never so abundant as white pine.

White pine—The white pine is much the most lofty tree which grows in our forests and the most valuable for its timber. Dr. Williams states the height of this tree to be 247 feet, but it is probable that a very few only have attained that height in Vermont. The tallest trees which have fallen under our own observation have not exceeded 170 feet. While the pine forests were standing, trees measuring from 140 to 180 feet were not uncommon, and they have often measured more than six feet in diameter at the base.

This species of pine was originally very abundant in all the western parts of the State, particularly in the neighborhood of Lake Champlain, and was found in considerable quantities along the bank of the Connecticut and most of our smaller rivers. But in consequence of the indiscriminate havoc of our forest trees by the early settlers, and of the common use of this tree for timber, boards and shingles for buildings and other domestic uses, together with the great demand for it for exportation, our forests of white pine have mostly disappeared, and boards and shingles of good quality are becoming scarce and difficult to be obtained.

Pitch pine—(Distribution not given.)

Double spruce—This tree is found in all parts of Vermont, sometimes constituting almost entire forests of considerable extent. It is the most plentiful evergreen upon the mountains, being found, though of diminutive size, on their very summits.

Single spruce—Much less plentiful than double spruce.

Silver or balsam fir—(Distribution not given.)

Black cherry—This tree is scattered, although very sparingly, over the greater part of the State. It sometimes reaches the height of fifty feet.

Tupelo, or sour gum—This tree, which is here usually called pepper-ridge, is found sparsely scattered through the southern and western parts of the State, but nowhere in large quantities. It grows to the height of nearly fifty feet.

White oak—The growth of the white oak is confined principally to the southern and western parts of the State, and even there was never much multiplied. The original growth sometimes attained the height of seventy feet.

Red oak—Though not very abundant is more plentiful and widely diffused than the white oak.

Chestnut—Is confined mostly to the southwestern parts, and to the towns lying along the banks of the Connecticut River in the counties of Windham and Windsor.

Hemlock—Is found in all parts of the State and in most parts in abundance.

American larch, or tamarack, or hackmatack—Rare in southern and eastern parts of the State, but common in northern and western parts.

Mountain ash, or moosemissa—Very common upon the hills and mountains, and when transplanted thrives well in all parts of the State.

White cedar, or arborvitæ—Was originally very abundant in the western and northern parts of the State, and is still found in many places in considerable quantities.

Red cedar—Formerly existed in some quantities along the banks and islands of Lake Champlain, but on account of the eagerness with which it has been sought for posts and other purposes, it has now [in 1842] become exceedingly scarce.

C. G. Pringle, in 1880, made an exhaustive report for the United States census authorities of the forest conditions existing at that time. Mr. Pringle, among other things of great interest, said:

The forests of Vermont, as compared with those of New Hampshire and Maine, are varied in composition. About the shores of Lake Champlain several western trees first appear, and throughout the State the forest is more generally composed of deciduous than coniferous species. Forests of spruce, however, spread over the high ridges of the Green Mountains, their foothills being covered with hardwood trees and little pine or hemlock occurring in the valleys. A forest of white pine once stretched along the banks of the Connecticut, and great bodies of this tree occurred in the northwestern part of the State, adjacent to Lake Champlain. The original white pine forests of the State are now practically exhausted. They are represented by a small amount of second growth pine only, which furnished during the census year a cut of 6,505,000 feet of lumber, board measure. . . .

Except on the summits of a few of the higher peaks of the Green Mountains, where black spruce and balsam fir grow to the exclusion of other trees, the aboreal growth is composed of a large number of species. In the valleys and on the foothills, and even on the slopes of the higher mountains in their lower portions, hemlocks mingle with spruce, beech, maple, and birch (yellow birch chiefly, for there is little white birch seen in northern Vermont); basswood, butternut, the ashes, red oaks, etc., are confined to the lower elevations and are less abundant than the trees first mentioned. Between the isolated patches of spruce and fir about the summits of the mountains and the region where hemlock is found, rock maple, yellow birch, and black spruce are the predominating species.

To estimate the area of valuable original forest still standing in the Green Moun-

tains is not an easy task. The belt extends from the Canada line to Massachusetts, and even into that State. The outlines of this belt are made very irregular by the cleared and settled valleys which run up among the mountains, and by reason of forest clearings, so that its width is constantly varying as we proceed from one end to the other.

The woodlands of the plateau, some ten miles broad and elevated from 200 to 300 feet above Lake Champlain, lying between the foothills of the Green Mountains and the lower plain beside the lake occupy, for the most part, rocky hills, and are composed principally of sugar maple, beech, basswood, white ash, black birch, and red oak. Certain limestone hills offer a favorable situation for the butternut, the ironwood, the slippery elm and the bitter hickory. The swamps and other lowlands yield the red maple, the black ash, the white elm, and the black willow. The latter, especially along streams, is associated with the alders and the sheepberry. The colder, sphagnous swamps are covered with a growth, more or less dense, of yellow cedar, black spruce, balsam, and larch; sometimes in the higher portions the white pine mingles with these, scattered or in groves. When grown in such soil this wood is liable to be extremely hard and brittle. The poplars occupy hillsides and ridges where the soil is a light, cold, sandy loam; with them the bird cherry is perpetually associated. The black cherry is scattered in a diversity of soils. White oak and hickory attain their best development on clayey soil or glades of slight elevation; on the red sand-rock hills they are smaller. Certain slopes of cold clay are still here heavily wooded with hemlock, while warm clay lands are the favorite site of the bur oak. In the vicinity of the lake and its tributaries low, wet shores are scattered over with the swamp white oak and the bur oak. The chestnut oak is common on the thin, poor soil of the red sand-rock hills, ranging through the valley from the lake as far back in some places as the foothills of the Green Mountains. The red pine appears on the sandy shores of Lake Champlain, and extends far up the Winooski River. The moister and more fertile portions of the sandy plain are still occupied to some extent by white pine, the poorer portions by pitch pine. The white birch occurs on cold, wet, sandy soil near the lake; and in the mountains the black spruce becomes the most common tree; with it in stronger soil are associated the yellow birch and the sugar maple. . . .

Four-fifths of that part of the county of Essex lying north of Guildhall and Victory is still in virgin forest, which will yield 5,000 feet of spruce per acre. The towns of Lewis and Averill are entirely unlumbered, and so is Avery's Gore. Colton is mostly covered with forest, and so is Ferdinand. Timber lands compose about two-thirds of Granby and Easthaven, and cover the back parts of the river towns and those crossed by the Grand Trunk Railroad. South of Guildhall and Victory the towns of Concord and Lunenburg are mostly cleared and settled. The proportion of hemlock in these forests is not large; there is considerable yellow cedar and a large amount of maple, birch, and beech—probably fifty cords per acre. There is but little pine in all this region, principally confined to the township of Lewis; elsewhere only occasional pine trees occur. . . .

At Newport, situated at the southern extremity of Lake Memphremagog, are several mills for cutting veneering from birch. The product of these mills is closely packed in boxes, so that it cannot warp, and sent to the manufactories near the large cities, to be used for chair bottoms and other purposes. Southward from Newport, in the valleys of the Barton and Black rivers, which flow northward into Lake Memphremagog, and of the Passumpsic River, which runs southward and joins the Connecticut, are almost continuous swamps of yellow cedar, black spruce and larch, from which the cedar timber is now being largely drawn to be sawed into shingles. At

Barton the hardwoods are largely cut into material for furniture, which is shipped toward the seaboard before being put together.

The valley of the Clyde River from Newport to Island Pond is cleared for the most part and improved for farms. The usual species of the northern forest occupy the summits of the low hills on either side of the valley. Eastward from Island Pond, down the Nulhegan River to the Connecticut by the line of the Grand Trunk Railway, we pass through the wild region from which the lumbermen have only taken some of the spruce and pine. Here beginning two or three miles back from the railroad, or in some places much nearer to it, a virgin and unbroken forest stretches over the slopes and summits of the hills for many miles to the northward and southward; black spruce, yellow birch, sugar maple and beech are its chief component species. In a few places where the soil is sandy, white pine occurs in straggling groves or isolated specimens, and the swamps as well as those of all of northern Vermont, are occupied by the black spruce, yellow cedar, and by a few scattering pines. The pine being the kind of lumber first secured, is seldom found now in these Vermont swamps. The cedars are now cut and manufactured into shingles, fence posts, railway ties, etc., for which purposes the lasting quality of the wood makes it eminently suited. There is little hemlock in northeastern Vermont, and it is believed to indicate poor soil wherever it occurs. The soil of this entire region presents a marked contrast to that of northern New York, being fertile and in other respects well adapted to agriculture. On this account land once lumbered over is generally occupied by the farmer and not allowed to come up again to forest, except in the more hilly portions. . . .

Reaching Montpelier from the west we have left behind the Green Mountain gneiss and entered a granitic formation. Here is an extensive burned region; the fire, in consuming the forest and vegetable mold upon the surface of the land, has exposed granite bowlders thickly embedded in the soil. To replace the forest growth thus removed there is only an occasional little spruce or balsam to be found among the thickets of bird cherry. The hilltop and hillside forests east of Montpelier show hemlocks everywhere mingled with sugar maples, yellow birches and spruce; farther east the spruce and birch predominate. Approaching the Connecticut River, hemlocks and maples again appear and second-growth white pine and paper birches take the place of the other species.

DISCOVERY AND TERRITORIAL CLAIMS.

It was in 1609 that Champlain discovered the lake which bears his name, and, therefore, the French were the first white men to set foot on Vermont soil. More than a century passed before any white settlement was established in Vermont, although a military post was established by the French on Isle LaMotte in 1665. In 1730 a few families from Canada located at Chimney Point, in Addison County, nearly opposite Crown Point, New York. Other settlements of comparatively brief existence were at Wind Mill Point, in Alburg, in Swanton and in Colchester.

The French encroachments had been met by the British, who in 1690 built a stone fort at Chimney Point, but which was not permanently occupied. The first settlement which was uninterruptedly maintained, and the first by English-speaking people, was at Fort Dummer, on the Connecticut River, south of Brattleboro, which was built in 1724.

About the middle of the Eighteenth Century disputes arose over what

were called the New Hampshire grants. The boundary north and south between Massachusetts and New York had long been in dispute, and New Hampshire claimed a western extension equal to that of Massachusetts, of which it was originally a part. One royal mandate fixed this boundary twenty miles east of the Hudson and along Lake Champlain, another fixed it along the Connecticut; thus what is now Vermont was claimed by both New Hampshire and New York. The governors of both New York and New Hampshire made numerous grants within Vermont, those of New York being largely confined to the western part of the territory, into which emigrants had gone both from Massachusetts and by way of the Hudson. In 1765 New York acquired authority from the British Crown to exercise jurisdiction over the New Hampshire grants as far eastward as the Connecticut River. Those who had settled in that territory, under grants from New Hampshire, resisted claimants under subsequent grants from New York, and this led to the bloodless war in which the Green Mountain Boys took an active part. The dark days of the Revolutionary War overshadowed local events like this and Vermont took advantage of it by asserting its rights and became *de facto* a separate state. By the treaty of peace with Great Britain, in 1783, Vermont was included in the territory belonging to the United States. But it was, in fact, thenceforth until its admission to the Union what the legend on its copper coins declared it to be—The Republic of the Green Mountains—and independent of every other government. Congress finally recognized Vermont as a separate state and admitted it to the Union in 1791, on the payment of $30,000 to New York in settlement of its claims.

Vermont was, until 1760, when the English secured sovereignty over Canada, before the white settlement, debated ground between the French and the hostile Indians on the one hand and the English and their Indian allies on the other, and consequently its settlement and development was slow. There were practically no permanent settlements of importance prior to 1760 along Lake Champlain, but by the opening of the Revolution settlement had progressed so as to cover fairly well the southern part of the State, with a fringe of settlement along the western border. During the Revolution Lake Champlain was a center of hostilities. When peace was restored, however, the development of the Commonwealth was rapid and about the beginning of the Nineteenth Century practically the entire State was occupied by a thriving population.

THE PRIMITIVE SAWMILL.

The sawmill followed permanent settlement, or, rather, accompanied it. There was hardly a farm but what was within reach of a mill site and so almost every available water power was improved and used to drive the grist mill or the sawmill, or both in combination. To show what wonder-

ful things the sawmill, shingle mill and turning lathe were a hundred years ago, the narrative of a veteran lumberman, giving his experiences of that time, is here interpolated. This story was published in the *Northwestern Lumberman*, in 1886, and ran as follows:

As to machinery in the early days, I might as well say there was none. Sawmills were built on small streams where the water could be easily handled. The frame of the mill was built of large hewed timber and very strongly braced; as a general thing nothing but the roof was boarded. The power to drive the mill was created by a dam to hold the water with a fall of about ten feet, head and fall making about twenty feet.

It required a large amount of power to manufacture lumber at that time, every part of the machinery being in a crude state. I have heard the noise of a sawmill two miles away. The amount of lumber sawed in a day averaged less than 4,000 feet. The logs were first growth and large. When a log had been sawed into boards or plank it was rolled off the large bungling carriage and split apart by means of a long wedge made of hardwood, many boards being split in the process, as there was a stubshot ten inches long to overcome.

Vermont, New Hampshire and Maine had plenty of mills, such as they were. The far West was at that time—seventy-five years ago [1811]—just beginning to come to the front, and mills and machinery began to improve. Shingles and clapboards were all rift, split out of straight-grained logs, and shaved. As to lath and pickets, there were none. All buildings that were plastered were lathed by the means of boards being split and nailed with spaces opened by means of a wedge.

The first shingle machine made its appearance about seventy years ago and was a great success, having been improved but very little since then. The first clapboard machine appeared about sixty-five years ago and was likewise a great success; laths and pickets appeared about fifty years ago. Up to that time the slabs which were not stinted were thrown into the rivers, where the rivers were large enough to float them away, or sold for building fences or piled in bulk and burned. Laws have been made within the last forty years to prevent slabs being thrown into rivers. That was one of the many reasons why laths and pickets have so largely been made of slabs.

It appears almost absurd and laughable when I give you a description of the turning lathe of seventy-five years ago, but it is, nevertheless, true. The lathe of that time consisted of a dry hardwood pole about twelve feet long and two inches in diameter, placed horizontally about eight feet from the floor, fastened at one end. A rope, strap or a cord of dry hide was fastened to the other end, with a turn around the piece to be worked, which was about three feet from the floor; the rope was made fast to a treadle, the end of which was made fast by means of a tenon in a mortise and a peg which made a hinge. The chisel or gouge was then placed in a rest and against the piece to be turned. The thing was then put into operation by placing one foot on the treadle, the spring of the pole and the weight of the pole keeping the thing in motion. As the foot bore down the piece would turn and the chisel would cut, cutting only one-half the time. The device answered very well and was largely used. The first improvement in the lathe was made about sixty-five years ago, which was effected by the use of a large wheel in the room of the pole and treadle. It took one man to turn the wheel and one to hold the chisel. That mode of turning continued until within fifty-five years, when steam power was used.

BEGINNINGS OF SETTLEMENT AND OF LUMBERING.

The first sawmill in Vermont of which there is a record was built in

Township No. 1, or Westminster, in 1738 or 1739, for the records show that proposals were issued for erecting a sawmill and a grist mill on September 26, 1737, and the records of a meeting held July 8, 1740, show that the said sawmill had been built. The census of 1840 showed Vermont as having 1,081 sawmills. By 1850 the number of establishments had dropped to 326; in 1860 there were 415 establishments; in 1870 there were 637 establishments; in 1880, 668; in 1890, 779 establishments, and in 1900 the census showed that there were 658 establishments.

The progress of the State both in settlement and in development of the lumber industry may best be described by counties[1] and, as the southern territory of Vermont was the first to be settled by the English, it is natural that in describing the development of the sawmill that territory should be chosen as a starting point.

BENNINGTON COUNTY.

The first township granted within the present limits of Vermont was chartered by Benning Wentworth, Governor of New Hampshire, January 3, 1749, and was called Bennington in honor of the Governor. The settlement of the township commenced in the spring of 1761, and the year following, 1762, Samuel Robinson and Joseph Safford had built the Safford mills—a grist mill and a sawmill—for which they received a bounty of $40 for each mill. These mills were erected in the eastern part of the township, and another bounty of $40 was given for erecting a sawmill on the western side of the town.

Pownal was settled in 1762, and in 1840 the town contained five sawmills.

Shaftsbury was settled about 1763. The country surrounding this town was covered with beautiful growths of white pine, and the timber on the highlands was, in 1840, mostly chestnut and oak; at that time there were twelve sawmills.

WINDHAM COUNTY.

Dummerston was one of the first settled townships in the State. It contained in 1791 upwards of 1,500 inhabitants. In 1840 there were five sawmills in the place. A little previous to the breaking out of the French war in 1744 a settlement was commenced and a fort built on the so-called "Great Meadow" near Putney, but on the commencement of hostilities the fort was evacuated and the inhabitants, together with those from adjacent towns, retired to Northfield, Massachusetts, which was the frontier post during that war.

The first permanent settlement of Putney was made in 1754. The low meadow lands, when the country was new, were covered with a tangled

[1] "History of Vermont," by Zadock Thompson, published in 1842, largely quoted in setting forth early settlement of counties:

growth of butternut, elm, soft maple and yellow pine. The higher flats abounded with white pine. Two sawmills are mentioned as being in operation in 1840.

The settlement of Rockingham was commenced in 1753, and in 1785 the first bridge over the Connecticut was erected at Bellows Falls. Its length was 365 feet. The second bridge was built at Windsor in 1796. There were seven sawmills in operation in 1840.

Vernon was one of the first settled townships in the State. The original growth of timber on the mountains had long been destroyed by fires and this was, by 1840, succeeded by a young and handsome growth of oak and chestnut. The town had four sawmills at that time.

In 1754 the land on which Guilford now stands was chartered to fifty-four proprietors. The settlement was made in 1761 and the land was naturally covered with maple, hemlock, walnut, beech, birch, ash, bass, butternut and elm. In 1840 there were six sawmills in operation.

The settlement of Jamaica was commenced about 1780, and in 1840 there were eight sawmills.

Marlboro was settled in 1763. It was thickly covered with timber among which were found beech, birch, maple, bass, spruce, oak, hemlock, pine, fir, ash and cherry. In 1840 there were nine sawmills doing business.

The settlement of the town of Newfane was commenced in 1766. The old growth of timber was principally rock maple, beech, birch, spruce and hemlock. There were twelve sawmills in 1840.

The first beginning toward the settlement of Athens was made in the fall of 1779. The following May Samuel Bayley, of Sterling, Massachusetts, and Micah Reed, of Westmoreland, New Hampshire, joined the settlement and during the following summer they, in company, erected a sawmill. In 1840 there was a sawmill standing on the site where the first mill was erected.

The settlement of Whitingham was commenced in 1770, and the timber surrounding it was maple, beech, birch, ash, spruce and hemlock. In 1840 there were nine sawmills in operation.

Windham was formerly a part of Londonderry, and in 1840 there were seven sawmills doing business.

The settlement of Wilmington was commenced before the Revolutionary War. In 1840 eight sawmills were sawing timber. In a small way, by means of portable mills, spruce was manufactured in this section from colonial days on. The lumber produced was consumed locally, as the means of transportation were meager, consisting principally of the mountain wagon roads penetrating the country. The cost of hauling lumber was so great that it was not delivered very far. The Deerfield Valley was not penetrated by railroads, and as it lay between two ranges of mountains,

it was a long distance from the centers of lumber distribution. It therefore happens that a country very old in lumber production was denuded of its timber only in comparatively small patches that were cleared for farm and grazing purposes. There is an expanse of timber land there today covering an area of upward of 100,000 acres that still contains virgin spruce in considerable quantity. Other lands upon which spruce was felled a century ago or more have naturally produced second growth timber, running from saplings up to sticks that will scale 1,000 feet.

WINDSOR COUNTY.

Chester was first chartered by New Hampshire February 22, 1754, by the name of Flamstead. On July 14, 1766, however, Thomas Chandler, one of the first settlers, obtained a charter from the State of New York for himself and thirty-six others, and the name of the town was changed to Chester. There were in operation in the town eight sawmills in 1840.

The settlement of Cavendish was commenced in the northern part by Captain John Coffein in June, 1769, at whose hospitable dwelling thousands of the Revolutionary soldiers received refreshment while passing through on their way to the military posts on Lake Champlain, nearly the whole distance being, at that time, a wilderness. In 1824 there were eight sawmills in this town.

Emigrants from Enfield, Connecticut, made the first permanent settlement at Andover in 1776. John Simons, one of the first settlers, erected the first sawmill and grist mill about the year 1780. In 1824 there were three sawmills at this place.

The first settler went to Bridgewater in 1779 or 1780. In 1784 settlements were commenced along the river in the southern part of the town. The first sawmill was erected in the northern part of the town in 1784 by George Boyce. Messrs. Hawkins built one which went into operation in 1785, and the Messrs. Southgate shortly thereafter built another.

The proprietors of Ludlow having offered a grant of fifty acres of land to anybody erecting a sawmill in the limits of the town, Ebenezer Gilbert, about 1790, built a mill between the two mountains on the west branch of Black River. The first man to dam the water of the Black River was Hezekiah Haven, who then built a sawmill, which was abandoned on account of an insufficient flow of water.

Hartford became settled in 1764. The timber surrounding it was principally white pine, beech, maple and birch. The first sawmill was erected as early as 1769. Another sawmill was established by Abel and Elisha Marsh, Benjamin Birch and Joshua Dewey about the year 1771. There were seven sawmills in operation in 1840.

The settlement of Woodstock was commenced about 1768. In 1776 Joab Hoisington built a grist mill and sawmill on the south branch of the

Quechee River, and about 1790 Doctor Powers built a dam and erected a sawmill in the west part of the village.

Settlement of the township of Rochester was commenced about the close of the Revolutionary War. The timber in close proximity to it was mostly hardwood, interspersed with some spruce, hemlock, etc. There were seven sawmills there in 1840.

Springfield was chartered in the year 1761. In 1774 a sawmill was built by William Lockwood. In 1840 there were six sawmills in operation.

The settlement of Stockbridge was commenced in 1784. The first grist mill and the first sawmill were erected in 1786. In 1840 there were four sawmills in operation.

Norwich in 1763, when the first settlers began to arrive, was rich in its forest growth of elm, bass, ash, butternut on the meadows, white pine on the plains and hills near the rivers and further back maple, beech, birch, hemlock, etc. The town contained nine sawmills in 1840.

RUTLAND COUNTY.

Probably the first settlement in this county was in the town of Danby in 1765.

Clarendon was granted both by New Hampshire and New York. The settlement was commenced in 1768 by people mostly from Rhode Island. Otter Creek runs through this town from south to north and receives Mill River and Cold River from the east, affording numerous sites for mills and other machinery. There were four sawmills doing business in 1840.

The first dwelling house in Castleton was erected in August, 1769, of which a Colonel Lee and his servant were the sole inhabitants the following winter. In 1770 other settlers arrived, chiefly from Connecticut. In 1840 there were three sawmills at the southern extremity of Lake Bombazine.

The settlement of the town of Brandon was commenced in 1775. In 1777 the town was visited by a party of Indians who killed two men, made prisoners of six of the other inhabitants and set fire to their dwellings and a sawmill which they had erected. There were ten sawmills in operation in 1840.

In 1774 Hubbardton received its first consignment of settlers. The first sawmill was built in 1787. This was followed by the erection of another in 1789. The township was well timbered with hardwood and hemlock, while pine was originally very plentiful. In 1840 there were nine sawmills.

Pitsford was settled in 1769. The timber covering this township was oak of several kinds, pine, maple, beech, birch, elm, basswood, ash, cherry, butternut, walnut, poplar, etc. There were eight sawmills in operation in 1840.

The settlement of Poultney was commenced in 1771. This township is watered by Poultney River and its numerous tributaries which afford a number of valuable mill sites. The timber was mostly deciduous, there being but few evergreens. A violent freshet in July, 1811, swept off from the streams there four grist mills and four sawmills.

Shrewsbury's charter was granted September 4, 1763, but its date of settlement is not given. In 1840 there were six sawmills in operation.

In Middletown Township the settlement was begun and mills erected by Thomas Morgan and some others shortly before the Revolution. The timber was mostly maple and beech.

ADDISON COUNTY.

The first clearing in Middlebury township was made by Colonel John Chipman, in 1766. Prospects were so discouraging that Colonel Chipman soon returned to Connecticut. In 1773 another settlement was undertaken. In 1776 the last of the inhabitants were driven out by the Indians, but returned the following winter and stayed until 1778. After the Revolution more settlers came. The first sawmill was erected in 1774 on the east side of the creek. In 1784 Daniel Foot erected a sawmill on the west side of the creek, which went into operation the next year.

The first attempt to settle the town of Bridport was made in 1768, but was at that time abandoned on account of the urgency of New York's claims. The town contained four sawmills in 1840.

Bristol was settled immediately after the Revolutionary War, by Samuel Stewart and Eden Johnson. Large quantities of sawed lumber have been shipped from this market. In 1840 there were eleven sawmills in operation in this town.

Ferrisburgh was first permanently settled in 1784 and 1785. No township in the State has afforded more or better timber than has this one.

The township of Monkton was settled in 1774 by John and Ebenezer Stearns, Barnabas Burham and John Bishop. This town contained three sawmills in 1840.

The settlement of Lincoln was commenced in 1790. The timber was principally hardwood with some tracts of spruce. In 1840 there were seven sawmills in operation.

There were settlers in Salisbury prior to 1775. The timber consisted of maple, beech, oak, pine and cedar. There were six sawmills here in 1840.

ORANGE COUNTY.

The crank for the first sawmill built in Newbury was drawn from Concord, New Hampshire, a distance of nearly eighty miles, on a hand sled. In 1840 there were nine sawmills. Settlement was commenced in 1762.

The first settlement of Brookfield was begun in 1779 by Samuel Cross. Captain Cross built the first grist and saw mill.

The township of Chelsea was chartered under the name of Turnersburg in 1781. The name was changed to that of Chelsea in 1788. In 1840 there were ten sawmills.

There were nine sawmills in Randolph in 1840. It was chartered in 1781, although the settlement was commenced three or four years prior to this date.

The settlement of the town of Bradford was commenced in 1765. The first sawmill was erected by Benjamin Baldwin in 1774.

CHITTENDEN COUNTY.

"The first settlers of this county, in which Burlington is situated, did not engage extensively in manufactures of any kind. They discovered the value of the dense growth of the oak and pine which covered the surface of this part of the earth. The first person to open the lumber trade with the Canadians, by getting out large pine trees for ship masts and floating them in rafts to St. John, were two Germans by the name of Pottier and Logan, who settled on two points of land in Shelburne, as early as 1766. The market for all these trees was in Europe. King George well understood the value of the country, for by his decree the charters of all the towns which derived their existence from royal favor, were enjoined from destroying the forests of 'white and other pine trees fit for masting the Royal navy.' To communicate with European markets was easier than with any place in this country that was large enough to create a demand for timber in any quantity. The first sawmill built in this county or vicinity was that erected by Ira Allen in 1786. In connection with his brother, Levi Allen, who was in business at St. John, he opened a trade with Quebec, the chief article exported being lumber from the mills on Onion River at Winooski Falls. Stephen Mallett, of Colchester, took the first raft of oak timber to Quebec in 1794. Two years later John Thorp, of Charlotte, took a raft of norway pine from that town. This was the signal for the beginning of an extensive trade in oak and pine for masts and spars, square timber and deals. The possibilities of cutting and transporting timber were exceedingly meager in those days. It required nearly twelve months to cut a raft and prepare it for market. The chief point of departure was at Winooski Falls. There the rafts were constructed and 'the men with their tents, provisions and cooking utensils on board,' started on their long and tedious journey to Quebec. The principal dealers at this time were Ira Allen, Stephen Mallett, Benjamin Boardman, Henry Boardman, Amos Boardman, Ebenezer Allen, William B. Woods, Samuel Holgate, Judson Lamson, Joseph Clarke, Thaddeus Tuttle, William Catlin, Ezra Meech, of Shelburne; Daniel Hurlbut, Na-

PORTION OF THE WATER FRONT OF BURLINGTON, VERMONT, ON LAKE CHAMPLAIN

thanial Blood, of Essex; William Munson, William Hine, Hezakiah Hine, Jacob Rolfe, Allen Hacket, David Bean, Herman Allen, of Colchester; James Miner, Daniel Holgate, Junior, of Milton; Major Lyman King, of Burlington, and Roswell Butler. On the opening of the Champlain Canal and the perfecting of the water communications with New York, the trade in lumber shifted its direction to the south, and they who had rafted lumber to Quebec now took it in the same manner to New York and other markets on the Hudson, all of which were better than those at Quebec.

"Among the more prominent men who carried on trade in this direction were Henry Boardman, William Hine, Hezekiah Hine, Jacob Rolfe, Amos Boardman, Joseph Clarke, Roswell Butler and Nathaniel Blood.

"A younger generation were also just making their appearance 'on the Rialto.' Soon after this the manner of shipping lumber was changed, and the schooner and canal boat were substituted for the raft. Justus Burdick and Follett & Bradley, of Burlington, were extensive dealers, and where Samuel Brownell, of Williston, manufactured lumber at the Little Falls on the Winooski, about 1835, the rafting system had disappeared, and by 1843 it seemed as though the trade must perish for lack of material. The country was apparently stripped of all its valuable timber, so prodigal had the lumberman been of their possession. The eastern New England states were affected with the same scarcity and could no longer carry on the trade which had been the subject of all their competition with the inhabitants on Lake Champlain. But Burlington was more fortunate in its situation; for on the opening of the Central Vermont, the Rutland & Burlington, and subsequently of the Burlington & Lamoille Valley railroads, with their several New England connections, immediate communication with all parts of the East as well as the South was obtained, and the forests of Canada and the West became the sources of supply. Burlington, being the only point on the lake at which the railroads and the lake navigation came together, was the most conveniently situated for transhipment. That city, therefore, regained its old time prestige as a lumber depot, and acquired even greater prosperity. It has ceased to produce, but its extensive market is fully supplied. This accounts for the vast accumulation of lumber on and around its wharves, and for the number of planing and dressing mills and other kindred manufactories which have given this city the reputation of being one of the most important business centers in northern New England."[2]

The history of the lumber industry of Burlington will be taken up in the next chapter.

The first attempt to settle Charlotte was made in March, 1776. The town had five sawmills in 1840.

[2] "History of Chittenden County, Vermont," by W. S. Ramm, 1886.

Colchester was chartered June 7, 1763, with its present name; but from the fact that among the grantees there were ten by the name of Burling, it is supposed Burlington was the name originally intended for this town, but through some mistake was given to the town adjoining it on the south. The settlement of this town was commenced in 1774, at the Lower Falls of Winooski, or Onion River, by Ira Allen (brother of Ethan Allen) and Remember Baker. From the spring of 1776 the town was abandoned by the settlers until after the close of the war, in 1783, when Messrs. McClain, Low and Boardman settled on Colchester Point, and General Allen returned and renewed the settlement at the falls. Mr. Allen erected mills. The water power there is sufficient for almost any amount of machinery.

Essex is seven miles northeast from Burlington and was chartered June 7, 1763. The first permanent settlement was made in this township in 1783. The first sawmill at Hubbell's Falls was erected in 1804.

The settlement of Huntington was commenced in 1786. There were five sawmills in 1840.

The settlement of the township of Milton was begun February 15, 1782. The lumbering business engrossed much of the attention of the early inhabitants.

The settlement of Underhill was commenced about 1786. The timber was principally hardwood, interspersed with spruce and hemlock. In 1840 the town contained ten sawmills.

WASHINGTON COUNTY.

The principal proprietors and first settlers of Calais were from Charlestown, Massachusetts. The settlement of this town was commenced in the spring of 1787, by Francis West, from Plymouth County, Massachusetts, who commenced felling timber on a lot adjoining Montpelier. The first permanent settlers, however, were Abijah, Asa and P. Wheelock, who started from Charlestown June 5, 1787. In 1793 the first sawmill and grist mill were erected by J. David, of Montpelier and Samuel Twiss. There were eleven sawmills in 1840.

Marshfield was granted to the Stockbridge tribe of Indians, October 16, 1782, but was later purchased of the Indians by Isaac Marsh, of Stockbridge, Massachusetts, from whom the town derives its name. Stephen Pitkin built the first sawmill in 1802.

The first attempt to settle Montpelier was made in 1786. In 1788 Colonel Davis erected a sawmill. The mill privileges were both good and numerous.

The first settlement of Northfield was made in 1785. The principal stream is Dog River, which runs through it and afforded a great number of valuable mill privileges to the earlier settlers. The timber is hem-

lock, spruce, maple, beech and birch intermingled with fir, pine, ash and butternut.

Waterbury was settled in 1784. The timber was generally hardwood, with a considerable mixture of spruce and hemlock. There were ten sawmills in 1840.

The settlement of Warren was commenced about 1797. Ten sawmills were in operation in 1840.

CALEDONIA COUNTY.

The settlement of the town of Burke was begun about the year 1790. A sawmill and grist mill were erected here by Roman Fyler and his sons about the year 1800. The sawmill was destroyed by fire the next year, but was soon rebuilt.

Danville's first mills were saw and grist mills erected in 1787.

The settlement of Groton was commenced in 1787. The timber was mostly spruce and hemlock, interspersed with maple, beech and birch.

About the year 1790 the first permanent settlement was made at Hardwick. The timber was a mixture of maple, birch, hemlock, spruce, etc.

Ryegate was originally settled from Scotland. There were five sawmills in 1840.

The first settlement at St. Johnsbury was made in 1786. The first sawmill was built in 1787.

Peacham was chartered December 31, 1763. There were six sawmills in 1840.

Settlement in Waterford was begun in 1787. The surface is generally rough and stony, and the timber originally was maple, beech, birch, spruce and hemlock. In 1840 there were eight sawmills.

FRANKLIN COUNTY.

Elisha Bartlett built the first sawmill in Georgia about 1790. The rude and simple apparatus for this mill—the saw, water wheel, rag wheel, crank, gudgeon, etc.—was purchased by Ethan Allen, for Mr. Bartlett, at Troy or Albany, carried over to Bennington, and thence toted somehow far up into the north woods and put into place. Mr. Bartlett lived to be 100 years and nine months old.

Before the conquest of Canada by the English, the French and Indians had a settlement at Swanton Falls, consisting of about fifty huts. They had also built a sawmill, and the channel, cut through the rocks to supply water for it, still remains. The first permanent white settlers went there about 1787.

The settlement of Enosburg began in the spring of 1797. The streams afforded numerous and excellent mill privileges. There were eleven sawmills in 1840.

Fairfax was chartered August 18, 1763. The first settlers went to this township from Piermont, New Hampshire, in 1783. There were ten sawmills in 1840.

The first settlement of the township of Highgate was by Germans, mostly soldiers who had served in the British army during the Revolution. In 1840 there were eight sawmills.

LAMOILLE COUNTY.

The first settler of Cambridge was John Spafford, in 1783. The first sawmill was built in 1784 by Amos Fasset.

The settlement of Morristown was commenced in 1790. In 1798 Captain Safford built the first sawmill. The timber is maple, beech, birch, hemlock, etc.

The settlement of Stow was commenced about 1793. There were seven sawmills doing business in 1840.

ORLEANS COUNTY.

The settlement of Barton was begun about the year 1796 by Jonathan Allyne, Asa Kimball, James May and John Kimball. The first settlers were from Rhode Island and New Hampshire.

The settlement of Charleston was commenced in 1803. There were four sawmills in 1840.

The first settlement in Craftsburg was commenced in the summer of 1788 by Colonel Ebenezer Crafts, who during that summer opened a road from Cabot, eighteen miles, cleared ten or twelve acres of land, built a house and sawmill and made considerable preparation for a grist mill.

Derby was first settled in 1795. The river Clyde passes through the southern part of the township in a northwesterly direction, affording numerous mill seats. The town contained eight sawmills and one shingle mill in 1840.

Greensborough's first settlement was begun in 1789. In 1790 Timothy Stanley erected the first sawmill. In 1840 the land was well timbered, mostly with hardwood, spruce, cedar and fir.

The settlement of Tunbridge was commenced about 1776. There were ten sawmills in 1840.

CHAPTER XII.

VERMONT—TRADE AND STATISTICS.

Vermont ranks third among the New England states as a producer of spruce lumber, the total cut in 1902 having been estimated at 150,000,000 feet, four-fifths of which was spruce.

George F. Wells, in a report of the State Board of Agriculture of Vermont, gives some instructive figures concerning the Vermont lumber industry and its decline. Lumber was the first available economic resource of the State, and at present its production and manufacture constitute the most important single manufacturing industry. About fifty-five percent of the area of the State is thought to be still covered by forests, and in the lumber industry is invested nearly twice the capital placed in any other business.

There was a general growth of the lumber industry from 1860 to 1890, but since 1890 there has been a marked decline. In 1890 there were 779 establishments, employing 6,054 wage-earners; the capital invested was $7,789,874 and the value of the product was $6,958,674. In 1900 there were 658 establishments, with 4,743 wage-earners; capital $7,051,523, with a production of $6,131,808. Inasmuch as the mechanical advantages for lumber harvesting are greater than ever and the demand for lumber increasing, the only conclusion is that the shrinkage is due to the disappearance of the forests.

C. D. Howe, who has made extensive forestry investigations throughout Vermont, knows of thirty-five towns where forest resources have been seriously curtailed, if not entirely exhausted.

Mr. Wells suggests that "a method of lumbering that would maintain a balance between the harvesting and the growth of forest, would keep many towns from decay," and a little practical application of simple forestry principles might prevent destruction in many sections.

One of the causes which is preventing natural reafforestation in Vermont is a peculiar one. It is said that for fifty cents a hundred farmers in the upland counties of the State are cutting down the young spruce, hemlock and balsam trees to be used in New York and Boston and other eastern cities for Christmas trees. Every year buyers from the large cities purchase trainloads of trees. The traffic had reached such a state in 1904 that a bill was introduced into the Vermont Legislature to stop this denudation of the forests. It was claimed that the State was indulg-

ing in a remarkable piece of folly in selling for half a cent a tree that in a few years would be worth many dollars. The bill, however, was killed. It is estimated that 500,000 trees are thus taken annually from the State.

On behalf of the State Forestry Commission of Vermont, Ernest Hitchcock, commissioner, has submitted to the Governor a report showing that 4,000,000 acres of land in the State is of a character suitable only for timber growth. At present this acreage is nonproductive, but Mr. Hitchcock claims that if handled properly a revenue of $1 to $2 an acre could be realized annually. Coöperation with the national Forest Service is recommended.

The extent of the Lake Champlain lumber transportation of twenty years ago can be but feebly realized now. At that time there were 400 steamers and barges engaged in this trade. A single tow arriving at Burlington often scaled 3,000,000 feet of lumber. The barges used in the Ottawa and Burlington trade carried from 250,000 to 300,000 feet of lumber each. The Champlain barges of the upper class—those engaged in the Ottawa and Burlington trade—were all Canada bottoms and went no farther south than Burlington. This was because there was an international regulation which prevented Canadian boats from passing southward out of this lake into the canal and Hudson River. Since the Canadian vessels could not go to Albany and New York, they were built as large as the capacity of the Canadian canals would permit, which was larger than if they had had to pass through the Hudson and Champlain Canal. They were constructed wide and flat, like a canal boat, and thus had a larger capacity to hold lumber than they appeared to have when seen at a little distance. It was not an uncommon sight to see ten of these barges in tow of a single steamer.

The Ottawa River lumber that went through Lake Champlain to Albany and New York at that time was carried in a smaller class of boats, built for the purpose. The old sloop and schooner rigged canal boats, that forty years ago carried nearly all the traffic on Lake Champlain were nearly all gone in the '80's. In 1887 an unusually large amount of lumber was shipped by rail, in consequence of favorable rates. This led many lumbermen to believe that the railroads would in time supersede the canal.

STATISTICS OF LUMBER PRODUCTION.

The United States census of 1900 shows that there were, at the beginning of the Twentieth Century, 658 sawmills, planing mills attached to sawmills, and timber camps in Vermont, with an invested capital of $7,051,523, representing the interests of 615 proprietors and firm members. There were eighty-four salaried officials, clerks, etc., who drew $53,243 annually in salaries.

The average amount invested in machinery in each establishment was $2,527 and the average annual product was $9,319. The average number of wage-earners was six; average total wages paid $1,801; average annual product per wage-earner $1,692, and the average wages paid each wage-earner annually $327. Stumpage values were, hemlock, $2.01; spruce, $2.04.

The following comparative statement shows the number of establishments, amount of capital invested, number of wage-earners employed, amount of wages paid, cost of materials used and the value of products of the lumber industry from the year 1850 to 1900, inclusive:

COMPARATIVE LUMBER STATISTICS, 1850–1900—VERMONT.

	1850.	1860.	1870.	1880.	1890.	1900.
Number of establishments	326	415	637	688	779	658
Capital	$438,025	$862,060	$2,872,451	$3,274,250	$7,789,874	$7,051,523
Number of wage-earners	606	939	2,782	2,511	6,054	4,743
Wages	$153,288	$244,551	$729,925	$426,953	$1,501,776	$1,532,957
Cost of materials used	$303,306	$477,798	$1,731,516	$2,021,868	$3,854,670	$2,638,050
Value of products	$618,065	$928,541	$3,525,122	$3,258,816	$6,958,674	$6,131,808

The forest products of Vermont, according to the United States census of 1900, were as follows:

FOREST PRODUCTS OF VERMONT—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
Yellow pine	100,000	$ 1,000
White pine	18,878,000	209,428
Hemlock	41,444,000	422,153
Spruce	254,853,000	2,833,021
All other conifers	171,000	1,742
Total conifers	315,446,000	$3,467,344
HARDWOODS:		
Ash	1,200,000	$ 19,307
Birch	16,251,000	197,944
Chestnut	347,000	4,840
Elm	628,000	7,114
Hickory	25,000	500
Basswood	2,852,000	36,069
Oak	7,489,000	100,103
Poplar	271,000	3,642
Maple	16,202,000	220,508
Other hardwoods	5,068,000	67,115
Total, hardwoods	50,423,000	$657,142
Total, rough lumber	365,869,000	$4,124,486

SHINGLES.

	Quantity, pieces.	Value.
White pine	2,715,000	$ 5,768
Cedar	7,086,000	14,157
Hemlock	6,913,000	13,151
Spruce	34,533,000	70,854
Other conifers	1,279,000	1,669
All hardwoods	373,000	1,060
Total, shingles	52,899,000	$106,659

COOPERAGE MATERIALS.

	Quantity.	Value.
Staves, pieces	2,050,000	$ 21,285

FOREST PRODUCTS OF VERMONT—CENSUS OF 1900.—Continued.

OTHER SAWED PRODUCTS.

	Quantity.	Value.
Bobbin and spool stock, feet b. m.	2,484,000	$ 45,352
Furniture stock, feet b. m.	7,002,000	115,189
Carriage and wagon stock, feet b. m.	406,000	7,905
Lath, pieces	9,314,000	18,684
All other sawed products	.....	352,982
Total, other sawed products	.....	$540,112

TIMBER CAMP PRODUCTS.

Cooperage stock, cords	10	$ 200
Fence posts, pieces	5,200	308
Logs cut for export, feet b. m.	403,000	3,325
Logs cut for domestic sale, feet b. m.	6,649,000	39,975
Handle stock, cords	307	2,550
Hemlock bark, cords	1,967	8,553
Oak bark, cords	75	400
Railway ties, pieces	10,723	3,305
Masts and spars, pieces	2	100
Charcoal, bushels	100,000	6,000
All other products	.....	14,100
Amount received for contract work	.....	900
Total, timber camp products	.....	$79,716
Total, planing mill product	$1,845,156	
Less value of lumber used	1,214,568	$630,588
Grand total, value forest products	.....	$5,502,846

The subjoined table shows the comparative summary of the lumber and timber products of Vermont for the years 1900 and 1905, including the principal items of the census and also the quantity, value and principal varieties of rough lumber. It will be found that the figures for 1900 do not agree with the figures for the same items in preceding tables of this chapter. This is explained by the fact that the act of March 6, 1902, confined the census of 1905 to manufacturing establishments conducted under what is known as factory system, exclusive of the so-called neighborhood and mechanical industries. In making the canvass of the lumber mills, in order to conform with the law, it was necessary to omit the sawmills engaged exclusively in custom sawing and those whose output was consumed in the immediate neighborhood of its manufacture. In order to make the figures for 1900 comparable with those of 1905, the total for the former census was revised:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—VERMONT.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	497	[1]418
Capital	$4,956,806	$5,409,750
Salaried officials, clerks, etc.:		
Number	90	[1]79
Salaries	$56,168	$63,924
Wage-earners:		
Average number	5,312	14,216
Wages	$1,629,537	$1,809,503
Miscellaneous expenses	$403,628	$774,931
Cost of material used[2]	$2,569,870	$4,248,861
Value of products[2]	$5,940,610	$7,954,234
Quantity, Value and Principal Varieties of Rough Lumber:		
White pine:		
Thousand feet b. m.	16,280	13,898
Value	$181,249	$194,568

[1]Decrease.

[2]Includes a duplication—the value of rough lumber, which in 1905 amounted to $2,065,793, remanufactured in planing mills connected with sawmills producing it.

Hemlock:		
Thousand feet b. m.	36,347	42,574
Value	$371,656	$533,684
Spruce:		
Thousand feet b. m.	239,856	205,289
Value	$2,678,548	$2,897,510
Birch:		
Thousand feet b. m.	15,545	23,482
Value	$190,184	$341,556
Basswood:		
Thousand feet b. m.	2,213	4,165
Value	$27,780	$68,183
Oak:		
Thousand feet b. m.	6,899	3,471
Value	$91,917	$57,495
Maple:		
Thousand feet b. m.	15,257	28,930
Value	$206,470	$483,599
Ash:		
Thousand feet b. m.	970	3,471
Value	$15,636	$61,360
All other:		
Thousand feet b. m.	15,960	11,958
Value	$247,140	$167,441
Total quantity	349,327	337,238
Total value	$4,010,580	$4,805,396

Vermont's contributions to lumber commerce have been chiefly in the form of logs and timber. This industry was developed first on the western side of the State. Timber was floated from Lake Champlain down the Richelieu River to the St. Lawrence, and, under English rule in Canada, this industry assumed large proportions, in fact, this was practically the only outlet for the products of western Vermont, in which part of the State white pine most abounded.

A very large business was done in white pine and elm timber by this route. F. André Michaux, in his "North American Sylva," published in Paris, in 1810–13, on the authority of the custom house records at Fort St. John, Quebec, stated that, "The quantity of this wood [white pine] that passed down the Sorel for Quebec between the 1st of May, 1807, and the 30th of July following was 132,720 cubic feet of square timber, 160,000 feet of common boards, 67,000 feet of planks two inches thick, twenty masts, and 4,545 logs of the same dimensions [fourteen to eighteen feet] as are brought from the District of Maine." Mr. Michaux further stated that "Next to the District of Maine, which furnished three-quarters of the white pine exported from the United States, including what comes from New Hampshire by the Merrimack and is brought to Boston, the shores of Lake Champlain appeared to be the most abundantly peopled with this species and to be not unfavorably situated for its transportation. All that is cut beyond Ticonderoga, comprising about three-fourths of the length of the lake, which is 160 miles from north to south, is carried to Quebec, 270 miles distant, by the Sorel and the St. Lawrence. What is furnished by the southern part of the lake is sawn at Skeensborough, transported seventy miles in the winter on sledges to Albany and with all the lumber of the North River brought down in the spring to New York in sloops of eighty or 100 tons to be afterward exported in great part to Europe, the West Indies and the southern states."

The opening of the Champlain and the Hudson canals gave an opportunity for the timber of northern New York and Vermont to supply the growing requirement of New York City and other markets reached via the Hudson, but by that time the white pine had almost disappeared from western Vermont and, in fact, had so diminished in all of the eastern part that the northeastern part of the United States was ready to import rather than export pine lumber.

The building of the Sorel Canal gave ingress to Lake Champlain of lumber from the Ottawa River in Canada on its way to New York, but the Sorel Canal would admit to Lake Champlain from the north barges larger than those which could pass from Lake Champlain to the Hudson and, consequently, in many cases reshipment was desirable and even necessary. Burlington, situated midway of the eastern shore of Lake Champlain, whose beautiful waters separate the states of Vermont and New York, became the natural *entrepôt* for this business and gradually developed as a distributing market until, with the opening of the railroads connecting Burlington with the markets of New England, it became a pine market of great importance, where was gathered lumber in large quantities for manufacturing purposes and distribution.

HISTORY OF BURLINGTON'S LUMBER TRADE.

At the time when Vermont was admitted to the Union, in 1791, the site of Burlington was a forest. The village then consisted of not more than three dwelling houses at the foot of what is now Battery Street. Tradition has it that Felix Powell was the first settler, and that he reached Burlington in 1773. Henry Rolfe, a lumberman of Burlington, published an article in 1863, in which he gave the following review of the early lumber operations at that point:

> The first cargo of lumber that arrived here [Burlington] from the Canadas for the eastern market was brought by L. G. Bigelow, Esq., in 1850. He associated with him in the business Enos Peterson, and they continued in trade until 1855. Messrs. C. Blodgett & Son, then of Waterbury, next commenced trade here, and are now in business. The St. Maurice Lumber Company shipped their lumber here during the two or three years that their mills were in operation. In 1855, the Hunterstown Lumber Company located their sales depot at this place; this company and Messrs. Blodgett & Sons having mills in Canada and shipping their lumber here for sale. In 1856 Lawrence Barnes, Esq., opened a yard here for the purchase and sale of lumber. He and his partners have added the planing and dressing of lumber to their business, and they are also the owners of the Pioneer Shops near the yards in which are carried on the various branches of manufacturing lumber.
>
> The sales of this market in 1860 amounted to about 40,000,000 feet, and the sum paid out for lumber in handling, sorting, piling and planing is about $40,000,000 per year.
>
> Little did the projectors of our railroads dream that within ten years after the completion of their roads, almost every available space on their ground at Burlington would be lumbered up with boards and planks on their distant voyage to Europe, South America, California and the far off isles of the Pacific, but such is the fact.

The lumber is brought here from the mills on the Ottawa and St. Lawrence and their tributaries without sorting, and is here sorted to meet the requirements of the different markets.

If a ship at Boston, bound for Australia, needs a cargo of lumber, it is put into the cars at the planing mill, carried to Boston and unloaded direct from the cars to the vessel. If one for the West Indies calls for a load, it can be supplied with a cargo of rough boards with the same facility and dispatch. Every demand for pine lumber or any of its manufactures, whether rough, dressed, tongued and grooved, made into doors, sash, blinds or boxes, or even houses, ready made, can be furnished to order upon short notice. With the extension of the wharves (in progress at present) of the Vermont Central Railroad Company, Burlington has facilities for increasing her trade to a much larger extent than at present, and bids fair to be second only to Boston as a lumber mart of New England.

The growth of Burlington, which was, and is, the only genuine lumber market in Vermont, was due to Lawrence Barnes more than to any other one man, for it was his energy, sagacity and influence that imparted to the town an impetus that placed it in the van as a wholesale lumber market. Such being the case, it is taken for granted that a brief sketch of Mr. Barnes' life will be of interest to the readers of this history.

Lawrence Barnes came of early New England stock, an ancestor, Thomas Barnes, having crossed the Atlantic in the historic *Speedwell* in 1656. He passed his boyhood on his father's farm in attendance at the district school. At twenty years of age he bought his time from his father and with $3, which he borrowed from a neighbor, he started out to make his fortune. After several years of lumbering in Maine, New Hampshire and Canada he finally landed in Burlington in the year 1856. Burlington was then a small place with little business and its merchants were suffering under the embarrassments of railroad complications. Mr. Barnes' first venture in the lumber industry at Burlington was the purchase of a lot of lumber at Three Rivers, Canada, which he at once began shipping to Burlington by boat for distribution by rail to different points in New England. He it was who hit upon the idea of dressing lumber before shipping it, by so doing saving 12½ percent in freight expenses, and this idea imparted new life to the lumber trade.

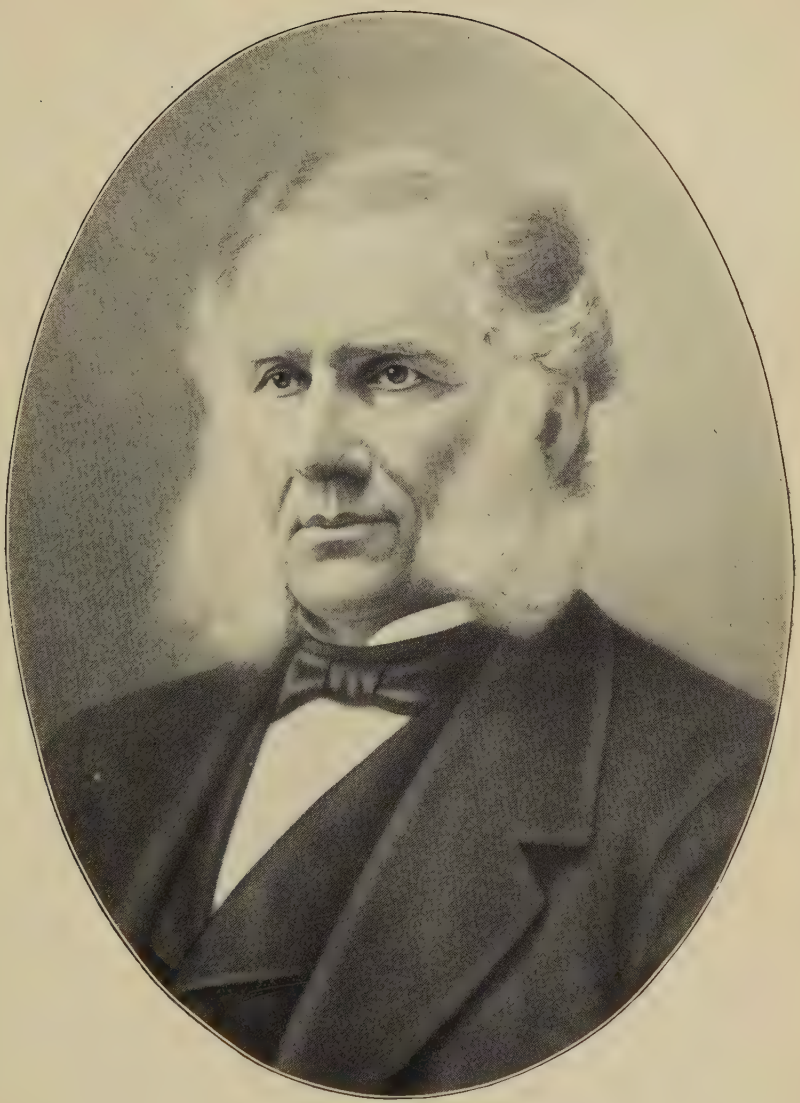
On the burning of the Pioneer Shops in 1858 the citizens of Burlington, at a public meeting, offered a bonus of $8,000 to any one who would rebuild the shops and equip them for business. Mr. Barnes accepted the offer and the plant was ready ninety days later. In 1859 Mr. Barnes took Charles Whitney, of Boston, Massachusetts, and David Whitney, of Detroit, Michigan, into partnership, and this was followed in 1862 by the admission of E. N. Skillings, of Boston, Massachusetts, and Mial Davis, of Burlington, the latter being a special partner, and the concern became L. Barnes & Co. The business continued to gain and offices were established at Boston, Detroit, Montreal, Ogdensburg, Albany and Whitehall.

In 1869 Mial Davis withdrew from the firm and became a partner in Shepard, Davis & Co., which concern bought Lawrence Barnes & Co.'s Canadian interests and Burlington mills. About 1873 L. Barnes & Co. became Skillings, Whitney Brothers & Barnes, but was dissolved later and Mr. Barnes formed a partnership with his son, L. K. Barnes, and D. W. Robinson, the concern being known as L. Barnes, Son & Co. Two years later the son retired and the concern was known as L. Barnes & Co.

In 1879 the Skillings, Whitneys & Barnes Lumber Company was organized. Mr. Barnes became its president in 1881 and continued such until his death in 1886. In 1897 the company was succeeded by the Robinson & Edwards Lumber Company, which concern is still in existence and is made up of D. W. Robinson, president, who came to Burlington in 1864; W. C. Edwards, vice president, and C. L. Smith, treasurer. Mr. Edwards is a well known lumberman of the Ottawa district, Ontario, and the company handles all the Edwards' lumber that is sold in the United States. Lawrence Barnes was very happily termed the father of the later and larger lumber business of Burlington.

Another pioneer of the lumber industry in Burlington was Willard Crane, who went to Burlington in 1856 in the employ of Lawrence Barnes. Prior to this, Mr. Crane had worked for Mr. Barnes in New York City, making sugar box shooks; also in Nashua, New Hampshire. In 1858 Mr. Crane left Mr. Barnes, and started in business with his brother, D. G. Crane, under the style of W. & D. G. Crane, the firm running a planing mill, box factory and lumber yards. Outgrowths of and associated with this firm are E. A. Pope & Co., engaged in the manufacture of boxes, the Queen Anne Screen Company, the Vermont Shade Roller Company and the Burlington Venetian Blind Company.

To return to Shepard, Davis & Co. This concern was composed of Otis Shepard, of Boston, Massachusetts, Lewis A. Hall, of Boston, and Mial Davis, of Burlington. There were three others who were taken in as members of the concern on a basis of percentage of profits, these being George H. Morse and William A. Crombie, both now of New York, and George C. Nichols. About October, 1876, Shepard, Davis & Co. failed in business and Otis Shepard, James MacLaren, of Ottawa, Ontario, George H. Morse, William A. Crombie and Frank Dudley, of Portland, Maine, bought the property and formed the Shepard & Morse Lumber Company. In 1891 Messrs. Morse and Crombie sold their stock in the company and withdrew. In 1903 the officers of this concern were H. G. Shepard, president; T. H. Shepard, treasurer, and H. S. Shepard, secretary. The MacLaren estate is a heavy stockholder in the company, which has sawmills at Ottawa, Ontario, main office in Boston, with a branch office in New York City, while at Burlington are its planing mills and yards.



LAWRENCE BARNES

FATHER OF THE MODERN LUMBER BUSINESS OF BURLINGTON, VERMONT
DECEASED IN 1886

One of the larger operators in Burlington is John R. Booth, of Ottawa, Ontario, who has planing mills, box factory and large yards in charge of his half-brother, E. J. Booth. Mr. Booth commenced business in Burlington in 1876. W. A. Woodbury, who later became a mayor of Burlington, was selected by Mr. Booth as manager of this business.

In 1860 the principal concerns in the lumber industry of this city were L. Barnes, W. & D. G. Crane, Calvin Blodgett and Henry Rolfe.

Fifty years ago Burlington ranked as the third wholesale lumber market of the United States, and today, though relatively less important, its business is substantial and amounts in volume to about 150,000,000 feet a year.

BURLINGTON INSPECTION.

The imposition of a duty of $2 a thousand feet on lumber from Canada, which went into effect in 1897, was a severe blow to the wholesale trade of Burlington, but it continued to receive stock in considerable quantities and used much of it in the manufacture of sash, doors, mouldings, house trim and other articles of use.

Although doing a large business in lumber, the extensive market of Burlington for many years had no systematized method of inspection, and a variety of individual customs prevailed, notwithstanding the endeavor on the part of all toward uniformity.

The grades recognized in the Burlington market were as follows: Select, shelving, second shelving, pickings, shippers, box and mill culls. A writer of 1881, said:

> These gradings apply to wide lumber from eight inches and upward.
>
> Strips twelve feet long are classed as first quality, second quality, third quality and box.
>
> Under twelve feet in length the classes of seconds and thirds are combined as one, while all unfit for this grade go into a still lower grade of third quality or into a new grade of box.
>
> Spruce is divided into three grades, namely: Clear, No. 1 and No. 2.
>
> *Selects.*—Comprise the finer grades of lumber, and include all fair widths approaching the upper grades of other markets, and suited to all the finer finishing purposes for which the timber is adapted.
>
> *Shelving.*—Includes ten, twelve and fourteen-inch stock, and is classed as first and second shelving, as to relative quality and adaptability to the purpose indicated; first quality ranks about $7 per thousand below selects, while the second quality is from $5 to $7 below the first. In both qualities more or less knots and sap will be allowed, not affecting the board for the purpose from which it derives its name.
>
> *Pickings.*—A grade of lumber of any width, suited to one side finishing, embracing sap boards, and generally such lumber as, while from width not fitted for shelving, is more defective than select, yet filling a position which must otherwise be occupied by selects. As in other markets, it may be called the cream of the common. It is relatively in price about $12 below selects.
>
> *Shippers.*—Are of diversified widths, without shake or case knots, and free from

large coarse knots, comprising the best of the common after the picks are removed.

Box.—Comprises a grade poorer than shippers, yet taking the run of the common, in all fairly sound and merchantable lumber. In price it is from $2 to $3 below shippers.

The grades of shelving (first and second), pickings, shippers, box, are, one and all, selections from common, made with reference to adaptability to the use indicated by their designations.

Mill culls.—Are the poorest grade of lumber adapted to any utility or recognized as merchantable and bear the same description as the same grade in other markets.

BURLINGTON LUMBER STATISTICS.

For the last three-quarters of a century Burlington has been a leading importer of forest products, although the subjoined statistics do not cover all of that time. The following compilations, however, were taken from Government records at Washington and are as complete as it is possible to secure. The first table shows the importation of unmanufactured wood from 1871 to 1905, inclusive—including cabinet wood, hewn timber, boards and other sawed lumber, shingles, other lumber and all other unmanufactured. The continuity of the cabinet woods ends with the year 1894—from that time on it will be found bunched with all other unmanufactured. Shingle importations for 1896 and 1897 did not appear.

IMPORTS—BURLINGTON, UNMANUFACTURED WOOD, 1871-1905.

Year.	Cabinet wood, value.	Timber, hewn, value.	Boards and other sawed lumber.		Shingles.		Other lumber, value.	All other unmanufactured, value.
			Feet.	Value.	Number.	Value.		
1871...	.....	$14,750	148,622,000	$1,438,504	.....	$ 8,919	$ 20,111	$ 44,305
1872...	$ 47,291	22,125	156,265,000	1,581,725	14,231,000	20,435	9,167	26,780
1873...	93,290	8,856	169,902,000	2,046,585	13,769,000	20,075	30,208	.....
1874...	79,326	16,181	93,746,000	1,152,077	7,244,000	10,062	22,664	.....
1875...	74,638	6,689	65,133,000	834,099	6,063,000	9,154	18,886	.....
1876...	58,699	6,471	56,016,000	679,784	3,039,000	4,268	23,592	.....
1877...	69,313	294	56,811,000	552,318	1,930,000	3 703	17,068	.....
1878...	73,349	484	57,816,000	476,167	6,192,000	10,015	20,959	.....
1879...	89,544	1,328	68,981,000	577,932	10,824,000	17,020	23,876	.....
1880...	113,541	4,288	115,509,000	974,782	14,467,000	23,368	43,578	.....
1881...	131,819	850	134,288,000	1,378,607	13,266,000	23,910	60,030	.....
1882...	183,405	816	138,095,000	1,517,224	12,460,000	22,935	108,019	.....
1883...	160,713	1,559	152,072,000	1,905,138	20,766,000	44,342	94,194	.....
1884...	159,966	2,424	152,150,000	1,847,777	17,043,000	36,624	125,601	9,205
1885...	131,573	.....	116,550,000	1,361,141	16,047,000	32,178	122,092	5,727
1886...	143,919	567	104,311,000	1,100,399	28,416,000	59,955	145,401	2,715
1887...	150,698	306	112,558,000	1,217,076	31,988,000	66,284	130,467	614
1888...	202,237	1,143	128,310,000	1,449,868	46,930,000	93,511	166,102	2,277
1889...	252,988	121	148,907,000	1,778,048	66,706,000	149,858	151,635	3,904
1890...	322,102	634	135,787,000	1,586,369	52,874,000	124,849	144,456	4,084
1891...	384,572	9,969	108,861,000	1,140,646	56,639,000	136,214	151,710	947
1892...	217,213	22,689	99,161,000	989 859	90,644,000	203,528	171,493	1,054
1893...	226,180	24,815	104,331,000	979,112	134,875,000	297,577	214,825	5,604
1894...	325,449	19,057	66,000,000	623,605	124,953,000	248,309	155,543	1,265
1895...	.....	1,987	94,710,000	948,104	17,708,000	35,412	50,027	661,022
1896...	.....	25,434	130,540,000	1,245,342	.....	.....	19,706	939,769
1897...	.....	3,424	158,228,000	1,435,542	.....	.....	13,209	1,068,257
1898...	.....	3,152	55,856,000	621,092	79,641,000	140,486	98,032	266,920
1899...	.....	3,017	58,634,000	500,917	61,896,000	106,820	105,553	136,214
1900...	.....	8,556	85,424,000	863,461	70,326,000	129,675	113,736	119,020
1901...	.....	2,610	47,773,000	565,857	65,251,000	116,779	81,882	255,742
1902...	.....	1,515	61,396,000	790,312	93,849,000	176,906	95,121	224,830
1903...	.....	2,509	65,269,000	820,378	94,937,000	186,567	163,708	286,810
1904...	.....	794	54,942,000	694,931	90,401,000	174,628	133,916	295,003
1905...	.....	1,975	61,310,000	827,416	82,944,000	162,668	119,606	468,378

It is to be regretted that the records do not show the importations of logs and round timber earlier than the year 1895, but the following table shows the importations from that year up to and including 1905. While the importations of logs and round timber are given in a separate table, the values are lumped in the preceding table under all other unmanufactured.

IMPORTATION OF LOGS AND ROUND TIMBER, 1895–1905.

Year.	Feet.	Value.
1895	13,739,000	$ 87,139
1896	29,610,000	156,525
1897	40,356,000	215,778
1898	1,023,000	7,933
1899	2,642,000	19,283
1900	593,000	5,027
1901	1,395,000	10,956
1902	3,219,000	24,546
1903	3,629,000	29,791
1904	1,369,000	11,165
1905	1,773,000	15,218

The following table shows the value of manufactured products imported to Burlington from 1856 to 1905, inclusive. The years 1866 and 1867 will be found blank. This is explained by the fact that no district returns are shown on the records for those years. The magnitude of the figures for the years 1869 and 1870 is explained by the reason that all wood importations, both unmanufactured and manufactured, are lumped together.

IMPORTS—MANUFACTURES, 1856–1905.

Year.	Value.	Year.	Value	Year.	Value.	Year.	Value.
1856	$ 5,362	1869	$1,370,974	1882	$ 23,225	1895	$ 46,893
1857	2,963	1870	1,816,439	1883	56,960	1896	146,358
1858	2,594	1871	59,092	1884	37,665	1897	179,588
1859	3,114	1872	66,603	1885	31,086	1898	79,267
1860	2,513	1873	38,162	1886	32,243	1899	71,382
1861	900	1874	25,164	1887	27,825	1800	164,884
1862	1,185	1875	37,862	1888	20,818	1801	151,086
1863	1,242	1876	43,542	1889	25,833	1802	196,141
1864	2,916	1877	24,765	1890	83,289	1803	208,897
1865	1,589	1878	34,283	1891	90,359	1804	118,533
1866	.....	1879	41,191	1892	118,962	2805	292,023
1867	.....	1880	57,097	1893	63,688		
1868	24,823	1881	47,990	1894	35,172		

The quantities and value of wood pulp imported from the years 1892 to 1905, inclusive, are shown in the following table:

IMPORTS—WOOD PULP, 1892–1905.

Year.	Quantity, tons.	Value.	Year.	Quantity, tons.	Value.
1892	2,378	$ 96,385	1899	4,402	$ 65,288
1893	2,181	51,538	1900	7,004	148,027
1894	1,062	26,997	1901	5,936	145,106
1895	2,168	29,389	1902	6,911	183,661
1896	6,000	78,602	1903	8,911	200,460
1897	9,436	129,786	1904	5,134	107,167
1898	4,588	69,296	1905	14,147	286,321

The following table showing the exportations of wood—unmanufactured and manufactured—for the years 1856 to 1905, inclusive, is made up of numerous items too scattered to tabulate separately as follows: Timber—sawed, $192,724; hewn, $9,248; logs, $26,912. Lumber—boards, planks and deals, $422,828; scantling, $5,285; shingles, $294; shooks, $6,571; staves, $3,140, and headings, $300. Manufactured—doors, sash and blinds, $9,951; hogsheads and barrels, $8,677; trimmings and mouldings, $21,403, and woodenware, $40,990. These items are incorporated in the columns designated "all other unmanufactured" and "all other manufactured."

EXPORTS—BURLINGTON, 1856-1905.

Year.	Unmanufactured wood.	Manufactures of wood.		Year.	Unmanufactured wood.	Manufactures of wood.	
		Furniture.	All other manufactures.			Furniture.	All other manufactures.
1856	.....	$ 13,309	$ 10,073	1881	$ 122	$ 76,558	$ 9,018
1857	$ 740	10,268	1,113	1882	61	62,321	3,228
1858	.....	1,523	1,430	1883	.....	68,992	10,732
1859	.....	4,260	6,300	1884	3,640	74,852	2,262
1860	57	5,868	.....	1885	701	66,407	2,525
1861	.....	2,643	5,692	1886	19	52,935	3,689
1862	2,093	5,971	3,854	1887	.....	44,152	3,752
1863	.....	9,564	2,141	1888	.....	25,709	7,987
1864	571	10,720	807	1889	.....	46,920	13,081
1865	318	27,639	2,820	1890	.....	52,225	7,393
1866	.....	.....	.....	1891	.....	152,459	9,163
1867	3,092	6,067	2,515	1892	76,420	146,400	18,543
1868	32	6,216	3,494	1893	40,075	120,907	25,645
1869	342	6,842	28,065	1894	97,590	283,110	104,257
1870	119	5,982	4,690	1895	29,421	200,462	56,097
1871	200	1,222	202	1896	48,119	160,907	49,166
1872	250	636	5,620	1897	53,575	198,622	84,831
1873	.....	284	4,971	1898	50,524	171,594	58,486
1874	1,566	100	4,074	1899	37,107	91,064	67,900
1875	.....	906	1,858	1900	32,743	31,198	108,839
1876	18	1,457	6,589	1901	95,586	6,453	90,943
1877	299	26,881	13,698	1902	62,360	15,281	93,433
1878	166	30,466	7,517	1903	131,039	15,531	130,339
1879	389	43,206	1,507	1904	111,153	15,949	128,500
1880	223	80,536	1,675	1905	96,531	23,103	148,641

The quantities and value of wood pulp exported from 1898 to 1905 are shown in the following table:

EXPORTS—WOOD PULP, 1898-1905.

Year.	Quantity, pounds.	Value.	Year.	Quantity, pounds.	Value.
1898	1,151,918	$9,568	1902	58,291	$ 525
1899	581,799	7,402	1903	62,941	591
1900	349,690	3,587	1904	232,095	4,459
1901	99,464	1,441	1905	384,983	6,678

The above tables relate to the business done by the customs district of Vermont, the port of which is Burlington. This district makes most of the importations and exportations of the state, but there is another on the extreme northern border of the state—the Memphremagog district.

Its custom house is located at Newport, at the southern end of Lake Memphremagog. Its records go back only to 1898, and for lumber they show as follows:

IMPORTS AND EXPORTS—MEMPHREMAGOG DISTRICT—1898–1905.

IMPORTS.

Year.	Unmanufactured wood.					Manufactures of wood.	
	Sawed lumber.		Shingles.		All other unmanufactured.	Furniture.	All other manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.	Value.
1898	12,807,000	$117,875	145,370,000	$263,253	$322,084	.....	$ 32,332
1899	35,659,000	289,890	182,894,000	332,910	505,006	$210	53,034
1900	59,151,000	474,070	220,698,000	421,260	594,555	69	63,793
1901	23,506,000	195,366	233,512,000	439,225	504,169	47	51,528
1902	23,865,000	211,747	237,981,000	463,036	555,523	168	45,368
1903	23,165,000	216,611	276,979,000	559,666	712,046	157	80,579
1904	20,009,000	184,174	268,097,000	550,360	785,662	160	113,967
1905	22,785,000	210,051	244,637,000	504,120	955,246	128	323,380
EXPORTS.							
1898	1,514,000	$32,110	.....	.....	$38,976	$1,387	$ 35,746
1899	2,842,000	50,754	.....	.....	5,086	2,526	117,486
1900	1,638,000	43,196	.....	.....	23,512	1,711	89,968
1901	1,675,000	39,436	.....	.....	10,310	2,016	241,316
1902	1,225,000	23,281	.....	.....	5,163	916	93,113
1903	2,100,000	35,448	.....	.....	5,740	1,816	71,560
1904	1,586,000	34,141	.....	.....	6,324	1,123	87,799
1905	873,000	18,607	.....	.....	2,105	4,353	94,509

So far as Vermont is concerned, the Connecticut River has been mainly a logging stream. There are mills all along that waterway, but these mills contribute little, if anything, to the supply of the general lumber market; but that great river was a convenient means for log transportation, and, while the greater number of logs floated down its waters to mills in Massachusetts came from the New Hampshire side, no small number was cut in Vermont and it still contributes to the supply of the great mills located at North Adams, Holyoke and other points in Massachusetts.

What the total lumber or timber product of Vermont has been is impossible to estimate with even reasonable accuracy. Today Vermont's lumber production is chiefly spruce with a sprinkling of hemlock, with which its higher altitudes were once well covered. It is only within recent years that the greater portion of this area has been made accessible by means of lines of transportation. In 1904 new lines of logging railroads were projected which will render available to the logger several hundred thousand acres of spruce lands which had been cut only in part for local uses. Much of the area that was cut from 50 to 100 years ago is now recovered by forests of considerable value and, as the soil and climate of Vermont are so well adapted to forest culture, it promises always to be a timber and lumber-producing State.

CHAPTER XIII.

MASSACHUSETTS AND ITS FORESTS.

In studying the history of the lumber industry of New England the investigator is inevitably impressed by the discovery that Massachusetts, notwithstanding its priority in settlement and its large natural resources in timber, never, from the beginning to the present time, has developed from its own timber wealth a lumber industry of importance to the general markets. Through its ports have gone large quantities of lumber to foreign countries, and its teeming industrial population has consumed still greater quantities, but its own sawmills, numerous as they have been and still are, have done little but supply purely local requirements. Those mills which have done more than this, of which there have been and still are a few, have drawn their log supplies largely from New Hampshire and Vermont. Even little Connecticut and Rhode Island seem to have figured in early days more largely in the general lumber markets than did Massachusetts—certainly much more largely when their relatively insignificant areas and forest resources are considered.

In retrospect, without a knowledge of the facts, Massachusetts well might be supposed to have occupied at an early date a position the reverse of that which actually was held by it at that time. Almost the entire area of the State, amounting to 8,038 square miles of land surface, was covered more or less densely with timber. The first permanent settlement in New England was in Massachusetts and the greatest population was there resident. Its area is only about 1,000 square miles less than that of either New Hampshire or Vermont, while it is nearly double that of Connecticut and between seven and eight times as large as that of Rhode Island. It has, to be sure, only 27 percent of the area of Maine, but it was thoroughly settled and its resources exploited when Maine was, but for a narrow fringe along part of its coast, still a wilderness.

The peculiar position which Massachusetts occupied as a lumber producer, whereby it was practically from the beginning a consumer of its own lumber product and an importer rather than an exporter, is accounted for by three principal facts: First, its immediate coast line was almost barren of forests, or timbered with an inferior growth; second, no rivers of importance entered the ocean along its coast line, except the Merrimac, and that had but a brief course in Massachusetts; third, the rapidity with which its area was opened to settlement produced

a consequently rapid enlargement of its own demand for forest products.

When the Pilgrim Fathers landed at Plymouth in 1620 they found a rocky and inhospitable coast. The forest was there in sufficient quantities for their own requirements, but when they wished to develop the beginnings of a lumber commerce they sought the already famous timber resources farther to the north, where available streams or deeply indented bays admitted vessels beyond the stunted timber of the immediate coast line to the magnificent trees which grew a little farther inland. Thus the first sawmills in New England were not in Plymouth Colony, or even in Massachusetts Bay Colony, but in Maine and New Hampshire.

THE SETTLEMENT OF MASSACHUSETTS.

To the casual reader of history two dates in the settlement of Massachusetts stand out with particular prominence—that of 1620, when the Pilgrims landed at Plymouth, and 1630, when, under Governor Winthrop, a much larger colony of Puritans founded Boston and the Massachusetts Bay Colony. But, while actual permanent settlement was begun at Plymouth, the further settlement of Massachusetts was not in such definite shape. During the ten years following the landing of the Pilgrims and before the 840 members of Winthrop's expedition landed, there was a constant development going on. The Pilgrims themselves were of a bold and enterprising character and sent expeditions along the coast for purposes of both trade and settlement. Thus it came about that Portsmouth, New Hampshire, was settled in 1623, and every year thereafter there were new arrivals from the old country, not all of whom settled in Plymouth.

Fisk says in regard to this period:[1]

> During the years immediately following the voyage of the *Mayflower*, several attempts at settlement were made about the shores of Massachusetts Bay. One of the merchant adventurers [of the Plymouth Company] took it into his head in 1622 to separate from his partners and send out a colony of seventy men on his own account. These men made a settlement at Wessagusset, some twenty-five miles north of Plymouth. They were a disorderly, thriftless rabble, picked up from the London streets, and soon got into trouble with the Indians; after a year they were glad to get back to England as best they could, and in this the Plymouth settlers willingly aided them. In June of that same year, 1622, there arrived on the scene a picturesque but illunderstood personage, Thomas Morton. . . . He was an agent of Sir Ferdinando Gorges, and came with some thirty followers to make the beginnings of a royalist and Episcopal settlement on the Massachusetts Bay. He was naturally regarded with ill favor by the Pilgrims as well as by the later Puritan settlers, and their accounts of him will probably bear taking with a grain or two of salt. In 1625 there came one Captain Wollaston, with a gang of indented white servants, and established himself on the site of the present town of Quincy. Finding this system of industry ill suited to northern agriculture, he carried most of his men off to Virginia, where he sold them. Morton

[1] "Beginnings of New England," Chapter III.

took possession of the site of the settlement, which he called Merrymount. There, according to Bradford, he set up a "schoole of athisme," and his men did quaff strong waters and comport themselves "as if they had anew revived and celebrated the feasts of ye Roman Goddes Flora, or the beastly practices of ye madd Bachanalians." . . . His men so far maintained the ancient customs of merry England as to plant a Maypole eighty feet high, about which they frolicked with the redskins, while furthermore, they taught them the use of firearms and sold them muskets and rum. This was positively dangerous, and in the summer of 1628 the settlers at Merrymount were dispersed by Miles Standish. . . . By this time other settlements were dotted about the coast. There were a few scattered cottages or cabins at Nantasket and at the mouth of the Piscataqua, while Samuel Maverick had fortified himself on Noddle's Island, and William Blackstone already lived upon the Shawmut Peninsula, since called Boston.

The Dorchester Company, under Reverend John White, established a station at Cape Ann in 1623, but the enterprise did not prosper and the company was dissolved. From the Cape Ann station a few colonists removed to Naumkeag, now Salem, a second Dorchester Company was formed in 1628, and a large grant of land was secured from the Council for New England. This grant included the coast from three miles north of the Merrimac River to three miles south of the Charles and was to extend from the Atlantic to the Western Ocean. In this patent is found the basis for the peculiar location of the northern line of Massachusetts, also for its southern boundary and for its territorial claims in the West. One of the patentees under this charter was John Endicott who, in 1628, went out with a small company and assumed charge of affairs at Naumkeag, the name of which was changed to Salem. The Puritans, with headquarters at Boston and Salem, sought more stable conditions and took advantage of the charter of the Dorchester Company, which was enlarged and a new charter obtained incorporating the "Governor and Company of Massachusetts Bay." Under this charter the Massachusetts Colony continued to conduct its affairs for more than a century.

During the third decade of the Seventeenth Century there was a thin scattering of settlers all along the coast, so that when Winthrop landed in Charlestown he found that there was a house on Shawmut Peninsula, that two other Englishmen had built a fort on the island which is now East Boston and that there was a settler on Thompson's Island. The Winthrop Colony, while its main body settled in Boston, scattered somewhat into the neighborhood of what was to be the metropolis of New England. It was now but a short time before the colonists began to spread out to cover almost the entire area of the State. The migration to Connecticut, which meant the beginning of the settlement of the Connecticut River Valley in Massachusetts as well as in the southern colony, began in 1635. In 1636 the banishment of Roger Williams inaugurated the settlement of Rhode Island.

Over 20,000 persons are estimated to have arrived in New England in the fifteen years prior to 1640 and these people scattered themselves over the eastern part of the State as far west as Worcester and to the southern part of the Connecticut River Valley, Springfield itself being incorporated in 1636.[2]

Captain Edward Johnson, in his book bearing the remarkable title of "Wonder Working Providence of Sion's Saviour in New England," published in London in 1654, in speaking of the natural resources and of the manufactures of New England, says:

> Everything in the country proved a staple-commodity. . . . Timber, masts, tar, sope, plank-board, frames of houses, clabboard, and pipestave. . . . Nor could it be imagined, that this Wilderness should turn a mart for merchants in so short a space, Holland, France, Spain and Portugal, coming hither for trade, shipping, going on gallantly, until the Seas became so troublesome, and England restrain'd our trade, forbidding it with Barbadoes, &c., and Portugal stopt and took our ships; many a fair ship had her frame and finishing here, besides lesser vessels, barques, and ketches, many a Master, besides Common Seaman, had their first learning in this Colony, Boston, Charlestown, Salem, and Ipswitch; our Maritan Towns, began to encrease roundly, especially Boston, the which of a poor country village, in twice seven years has become like unto a small city, and is in election to be Mayor Town suddainly, chiefly increased by trade by Sea.

It is evident, as we shall see later in reviewing the establishment of sawmills, that settlement far outstripped the erection of sawmills so that there never was a time when there was a surplus of forest products of any importance for shipment outside the State. The first settlers built log houses or laboriously hewed out timbers and plank and rived material for flooring, siding and roofs, but, as fast as practicable, sawmills were installed. In some cases when within reach of tide water, these were tide mills, but for the most part they were driven by the power of running streams. The exigencies of the case and the fact that the supply of sawed lumber was inadequate is shown by the numerous grants made to encourage the building of mills. As nearly all the streams of Massachusetts were small, there was little accumulation of logs at any one point, neither was there ordinarily any surplus of power; so the mills, for the most part, were small affairs disposing of their products in their own immediate localities. Practically the only exceptions were mills on the Merrimac and the Connecticut. These were large streams which permitted the rafting of logs to the mills and of lumber from the mills to tide water. The Merrimac has long since ceased to be a timber-driving stream of any importance; but, even at this time, over 100,000,000 feet a year is cut in large mills in Massachusetts from timber brought down the Connecticut River from New Hampshire and Vermont. But so great

[2] "Short History of the English Colonies," Chapter XVIII, H. C. Lodge.

is the demand of the State for lumber that the product of these mills is almost or quite confined in its distribution to southern New England.

From the earliest colonial times large quantities of timber have been cut in Massachusetts and converted into spars, lumber, staves and bolts. While the present output is comparatively small, Massachusetts may still be counted as a lumber-producing state. The chief remaining timber consists of a second-growth of pine, known locally as "farmer's pine," and various hardwoods.

FORESTS OF MASSACHUSETTS.

Originally, the entire eastern portion of the State was covered with a splendid mixed growth of white pine and hardwoods, while the central and western parts contained magnificent forests of chestnut, oak and other hardwoods. It was from the pine of eastern Massachusetts that the Pilgrim Fathers felled the trees from which their first homes were constructed; from which palisades were built as a protection against the Indians; and the puncheon floors and the "shakes" on the roof were rived from it.

The following is a list of the more important native trees of Massachusetts, taken from the report of George B. Emerson, published in 1846 as a State document:

Pinus strobus (white pine), *Pinus rigida* (pitch pine), *Pinus resinosa* (red or norway pine), *Tsuga canadensis* (hemlock), *Abies nigra* (black or double spruce), *Abies alba* (white or single spruce), *Picea balsamifera* (balsam fir), *Larix americane* [*americana*] (hackmatack, tamarack), *Cupressus thyoides* (white cedar), *Quercus alba* (white oak), *Quercus macrocarpa* (overcup white oak), *Quercus bicolor* (swamp white oak), *Quercus tinctoria* (black or yellow-barked oak), *Quercus coccinea* (scarlet oak), *Quercus palustris* (pin oak), *Quercus rubra* (red oak), *Fagus sylvatica*, var. *americana* (American beech), *Castanea vesca*, var. *americana* (chestnut), *Juglans cinerea* (butternut), *Juglans nigra* (black walnut), *Carya alba* (shellbark hickory), *Carya tomentosa* (mockernut), *Carya porcina* (pignut hickory), *Carya amara* (bitternut hickory), *Betula excelsa* (yellow birch), *Betula nigra* (red birch), *Platanus occidentalis* (buttonwood), *Populus grandidentata* (large poplar), *Populus lævigata* (river poplar), *Ulmus americana* (American or white elm), *Ulmus fulva* (slippery elm), *Nyssa multiflora* (tupelo), *Fraxinus acuminata* (white ash), *Fraxinus pubescens* (red ash), *Fraxinus sambucifolia* (black ash), *Ilex opaca* (American holly), *Prunus pennsylvanica* (northern red cherry), *Prunus serotina* (black cherry), *Acer rubrum* (red maple), *Acer dasycarpum* (white maple), *Acer saccharinum* (sugar maple), *Acer pennsylvanicum* (striped maple, moose wood), *Tilia americana* (basswood, linden, lime tree), *Berberis vulgaris* (common berberry [barberry]).

Something of the status of the forests of Massachusetts about 1875 may be gathered from the following excerpt from Volume I, of Emerson's "Trees and Shrubs of Massachusetts," published in that year; and are applicable, as well, to present conditions:

> The effects of the wasteful destruction of the forest trees are already visible. A very large proportion of the materials for shipbuilding, house building and manufac-

tories, in the towns along the coast, are now brought from other states. The manufacture of wooden bowls and other vessels made of a single piece has, in some towns in Berkshire, been given up, from the failure of the ashes, beeches, lindens and other suitable trees large enough for the purpose; and, in the western towns in Worcester County, materials less valuable than heretofore are necessarily, in some cases, used in the important manufacture of chairs. The same thing is taking place, almost imperceptibly, in all parts of the State. Every mechanic who works in wood looks every year more and more out of the State for his material. Every year we are more dependent on Maine and New York and some of the southern states, not only for ship timber and lumber for house building, but for materials for tanning and dyeing, for carriage-making, basket-making, plane-making, last-making and for furniture and the implements of husbandry.

Even these foreign resources are fast failing us. Within the last quarter of a century, the forests of Maine and New York, from which we draw our largest supplies, have disappeared more rapidly than those of Massachusetts ever did. In a quarter of a century more, at this rate, the supply in many places will be entirely cut off. In many parts of both these states, which recently furnished the most abundant supplies, agriculture is already taking the place of the lumber trade; and the disforested region, now changing into beautiful farms, will never be allowed to resume its original wilderness, or, if the attempt should be made to restore the forests, the experiment would require a hundred years.

Among the native trees, we have great choice from the number and variety and excellence of the species. In the narrow breadth of Massachusetts the species of native timber trees are more numerous than are found in any kingdom in Europe. We have nine large oak trees, four hickories, five birches, three large maples, three ashes, two elms, two spruces, two cedars, besides the beech, the chestnut, the hornbeam, the lever-wood, the tupelo, the hoop-ash, or nettle tree, the tulip tree, the plane, the bass, the locust, the hemlock, the fir, the hackmatack, the cherry, the holly, the several poplars, many willows, and a large number of smaller trees. Besides these, it is known that all the valuable trees of middle and northern Europe flourish here as if they were native and, in some instances, even surpass our native trees in the rapidity with which they grow. It thus appears that our soil and climate are perfectly well adapted to all kinds of wood which are found in temperate countries.

Of many of our forest trees the properties are but partially known. Some of them grow only in particular districts. Others are so unlike those found in the mother country that they hardly have a name. Of many, the habits and rate of increase, and the soil exposure and situation most favorable to their growth have not yet been studied. Of the nine large oaks found growing in Massachusetts, not more than five are often found in the same forest, and of these, two and often three, are not well distinguished by the land owner, though their value for different purposes is very different. The black oak and the scarlet are commonly confounded, from their class resemblance, although to the shipbuilder or the wagon-maker the former is far the most valuable; and both these trees are often confounded with the red oak, which, for timber or fuel, is comparatively worthless.

The rock chestnut oak, of great value for fuel and for timber and better adapted than any other oak for growth on rocky hills, is well known in only a few towns in the State. The mossycup oak, so valuable for treenails and small frame work, is found only in a small part of Berkshire. It would grow readily in any section. The rough oak, or post oak, is now found only in Martha's Vineyard and in parts of Plymouth and Barnstable. Similar observations might be made on half the trees of the State.

CHAPTER XIV.

MASSACHUSETTS—EARLY SAWMILLS.

Massachusetts occupies such a prominent place in the history of the country, that, although its lumbering industry ceased to be of great importance more than 100 years ago, mention may not inappropriately be made of the early sawmills erected in that Commonwealth, especially as the literature of that State abounds in reference to them. Massachusetts has preserved more early records than any other state in the Union, with the possible exception of Rhode Island. By exhaustive research of these records the author has been able to produce an approximately complete list of the first sawmills, from the time when they consisted of rude structures of logs, depending upon the outflow of the impounded waters of the tide for their power, down to the more modern ones deriving their motive force from steam. Some of the names of owners of these old mills suggest other names that today are prominent in the lumber business, in some instances the same operations having been carried on for several hundred years by one family.

The mills in each county are given in chronological order, beginning with Essex County, the northeasternmost county of the State, followed by the eastern counties in geographical rotation and ending with the county at the west extending the entire width of the State—Berkshire County.

ESSEX COUNTY.

There are several claimants to the distinction of being the "first" sawmill erected in Massachusetts, some historians giving the laurels to one mill, and others to another. This is due to the fact that the early records are capable of different interpretations, the exact date and location of mills sometimes being left to the judgment of the reader. Most of the historians credit Plymouth County with having the first sawmill erected in Massachusetts—that at Scituate—but exhaustive research of the oldest State and town records indicates that there were several sawmills built at an earlier date than this one, referred to later in their proper places. Several of these were in Essex County.

In the year 1645 there came to Lynn, Essex County, Massachusetts, one Joseph Jenks, who, in the following year, presented a petition for the exclusive personal right to a new application of water power to mills for various uses, including a sawmill.[1] In 1646 the Court resolved as follows:

[1] "A History of American Manufactures," Vol. I, by Bishop.

In Answer to the peticon of Joseph Jenks, for liberty to make experiences of his abilityes and Informations in ye making of Engines for mills to goe with water for ye more speedy dispatch of the worke than formerly, and mills for ye making of sithes and other Edged tooles, with a new Invented Sawe-Mill, that thangs may be afforded cheaper than formerly, and that for fouerteen yeeres without disturbance by any other setting up to like intentions, that so his study and cost may not be in vayne or lost; this peticion is granted so as power is still left to restrain ye exportation of such manufactuers and to moderate ye prices thereof if occasion so require.

Of the exact character of Joseph Jenks' improvement nothing is known. He was connected with the first iron works in the settlement at Lynn, but does not seem to have erected mills himself.

Manchester probably had the first sawmill erected in Essex County, and there were several built at very early dates in different parts of the town. A tide mill (the record does not say that it was a sawmill, but it is not unreasonable to suppose that it was)—a one-story log affair—which stood until 1826, was erected as early as 1644, "upon the river near the meeting-house."[2] There were as many as seven sawmills in Manchester at an early date, probably in the Seventeenth Century, one of which was referred to as the "old saw-mill" as early as 1694, and another one of which —on the Baker farm—was still standing in 1895. A mill was erected on what was then called "Brushie Plain" in 1705.

Andover boasts of a sawmill put up in 1644, likewise. Its owner was Simon Bradstreet, among the earliest settlers of the town, and his mill stood on the Cochichewick.[3] The town records contain the following references to mills:

1644. It is agreed by the town for encouragement, that such persons as shall undertake to build a corn and a sawmill shall have liberty to cut timber on any part of the common on the west side of Shawshin River. 1682. Granted liberty to any man, that the town or committee shall choose, to set up a sawmill, fulling mill and grist mill upon Shawshin River near Rogers Brook, to take up twenty acres of land adjoining said place, and to enjoy the same forever with the privilege of a townsman.

A quaint old book[4] referred to before, exact reprints of which are still in existence, in speaking of the town of Gloucester says that ships were built at that place, from which it may be inferred, though not necessarily, that a sawmill was available previous to 1654. The matter referred to is as follows: "This town lying out toward the point of the *Cape*, the access thereunto by Land becomes uneasie, which was the chief cause it was not more populated: There fishing trade would be very beneficial, had they men of estates to manage it: yet are they not without other means of maintenance, having good timber for shipping, and a very sufficient

2 "History of Manchester," by Lamson, 1895.
3 "History of Andover," by Abbot, 1829.
4 "Wonder Working Providence of Sion's Saviour in New England," by Captain Edward Johnson, London, 1654.

builder, but that these times of combustion the Seas throughout hath hindered much that work, yet have there been Vessels built here at this Town of late."

On Little River, in Haverhill, there was for nearly 200 years a sawmill on the same site, and the stream was most commonly known as "Sawmill River."[5] The last mill of the kind was taken down about 1840. The same authority tells us that up to 1651 the town of Haverhill was destitute of a sawmill, all the boards and planks used in building being hewed, unless brought in from Newbury, in the same county (which seems to indicate that Newbury possessed a sawmill at this time). "In either case, the expense and inconvenience was very great, and attention was early given to the establishment of a sawmill in this town, where both timber and water power was abundant." The authority for the setting up of a sawmill, quoted from the town records, bears the date of December 1, 1651, and is as follows:

> Voted and agreed upon by the inhabitants, that there should be a sawmill set up by Isaac Cousins, and such others of this town as shall join with him: the town and they agreeing upon terms, viz.: that they shall not make use of any timber within three miles of the meeting house:
> *Item.* That all timber without the compass of the three miles from the meeting house should be free for the use of the sawmill: they paying the twelfth hundred to the use of the town in general.
> *Item.* That the town for their use shall have boards and planks at three shillings per hundred in such pay as is merchantable. The town also reserving for themselves the liberty to make use of what timber they stand in need of, though it be without the three miles compass from the Meeting House.

On December 15 of the same year it was further agreed:

> Granted by the major part of the inhabitants, that Isaac Cousins shall have a sixth part of a sawmill or mills: and that Mr. Clement, Job Clement, Stephen Kent, William White, Theophilus Satchwell shall join with him, together with any others that they shall agree with, Provided that Mr. Coffin have liberty to have a sixth part of it, if he come to be an inhabitant in this town. This mill is to be set up upon the river, called Thos. Hale's river. . . . They are to make use of no timber that is within three miles of the meeting house, except it be pines or hemlock. . . . This mill is to be set up by April fifty and three: They have liberty also if they see fit, to set up a second mill by April, fifty and four: If they set them not up by these times above mentioned, then this grant is to be disannulled.

On the following day it was agreed that no sawmill should be set up "whilst these fore mentioned sawmills are going." At the town meeting in December, 1654, a parcel of land was granted to the sawmill owners "to plant and improve, so long as the sawmill shall go." This lot was on the west side of Sawmill River. In the following June eight acres were laid out on the farther side of Fishing River "toward the sawmill,"

[5] "History of Haverhill," by Chase, 1861.

from which allusion, together with several others, it may be inferred that there was also a sawmill on that stream at that time. In February, 1656, the town voted to cancel all grants and privileges if the present sawmill, or some other, did not cut a sufficient quantity of boards for the town by the following midsummer. This warning not being heeded, in 1658 the town lost all patience, declaring all former grants and privileges forfeited. It also granted the former privilege of the old sawmill to Thomas Davis, one of the owners of the old mill, John Hutchins and Daniel Hendricks on the condition that they would put up a mill and supply the needs of the town within twelve months. But this did not end the troubles of the town regarding its lumber supply, for no mill was erected and the town again declared the grant forfeited the next year.

Within a few years there was a mill or mills at Haverhill, for in 1664 the owners of a sawmill were allowed the use of 100 acres in which to pasture their oxen by paying an annual rental of 100 boards. But even later than this date by a number of years there were frequent and bitter complaints on the part of the inhabitants on account of the lack of mill accommodations. In 1675 the town voted to prosecute the owners of the sawmill for nonfulfillment of their agreement, but even this failed to have much effect, and the long-suffering town then took another step toward abolishing the monopoly in mill privileges by granting, in 1676, to one Richard Bartlett "the privilege to set a sawmill in Haverhill, on the north meadow river." It had taken the first step in this direction a few years before by granting permission for a second corn mill in town. It is supposed that Bartlett's mill was built on or near the site of Peaslee's mills, which will be mentioned later on.

In 1681 the town granted permission to Joseph Kingsbury, Samuel Hutchins, Robert Swan, Junior, and Josiah Gage to build a sawmill on Merrie's Creek, reserving to itself the right to allow others privileges on the same stream.

At a meeting in 1693 Joseph Peasley (Peaslee?) was granted the privilege of erecting a sawmill "at the head of the east meadow river upon the stream by or near Brandy Brow." This location was the one still occupied and known as "Peaslee's Mills" as late as 1861,[6] at which time, and, in fact, almost continuously since its erection, it was owned by a descendant of the original owner.

On East Meadow River, in 1757, Anthony Chase built a mill which continued in operation for many years.[6]

The first sawmill in Ipswich was erected on Chebacco River in 1656.[7] The town of Essex was originally a part of Ipswich. The conditions under

[6] "History of Haverhill," by Chase, 1861.
[7] "History of Essex," by Choate, 1868.

which the sawmill privilege was granted were that there should be liberty to cut timber, provided that none be cut within three and a half miles of the meeting house, that the town should have one-fifteenth of what was sawed and that no inhabitant be charged more than four percent. In 1665 Jonathan Wade was permitted to erect a mill on the same river. In 1667 Lieutenant Thomas Burnham was allowed to have one near the falls, but not so as to injure Mr. Wade's. In 1671 William Story erected another mill. In 1682 Jonathan Wade was granted permission to put one up at the falls. It is rather a curious fact that, though there were so many sawmills erected in this town at so early a date, it had no grist mill until 1693. The reason may be accounted for in the fact that shipbuilding was engaged in here, for the records state that twelve years after the first sawmill was put up, a grant was made of "one acre of ground, near Mr. Coggswell's farm, to the use of the inhabitants of Ipswich, for a yard to build vessels, for the use of the inhabitants, and the employment of workmen for that end."

MIDDLESEX COUNTY.

It is impossible to say whether Reading or Lexington possessed the first sawmill erected in Middlesex County, though it is probable that to Reading belongs the distinction. The following is quoted from Johnson's "Wonder Working Providence": "The Town of Readding had her foundation stone laid about this time [1644]. . . . This Town is well watered, and situate about a great pond, besides it hath two mills, the one a Saw-mill, the other a Corn-mill, which stand on two several streams." It is probable that the sawmill was put up shortly after settlement. The Lexington sawmill was erected about 1650.[8] It was owned by Edward Winship, of Cambridge, and willed by him to his son Edward, remaining in the family for more than a century.

The town of Chelmsford had a sawmill in 1656.[9] Four hundred and fifty acres of land were granted to Samuel Adams in consideration of his setting up a sawmill "provided he supply the town with boards at three shillings per hundred, or saw one log for the providing and bringing of another, to be ready to work the next March." The second sawmill in this township was put up in 1669. For the encouragement of this mill, some land was granted to Thomas Hinchman, William Fletcher and Josiah Richardson, who, in return therefor, did "covenant and grant to the town of Chelmsford, that the inhabitants thereof shall have their boards at four shillings per hundred and not exceeding that price, for any kind of pay that the inhabitants can make at prices current between man and man in this town; and that any of the inhabitants of the said town by

[8] "History of Middlesex County," Vol II, by Drake, 1880.
[9] "History of Chelmsford," by Allen, 1820.

giving timely notice to any of the owners, shall be supplied for their pay before others. And it is further agreed that the aforesaid owners of the mill shall have full liberty to take from the town common what timber they see meet to work for the mill."

The first corn mill in Framingham was built by Elder John Stone before 1659.[10] A little later a sawmill was set up on the same dam, probably by Daniel Stone, Senior. In 1707 a corn and sawmill was erected by Savill Simpson at a point about eight rods above where the Boston & Albany Railroad crosses the stream. In 1779 a saw and grist mill was built upon this same site by Captain Gilbert Dench and his son Isaac. In 1795 a sawmill was built on Cochituate Brook by Ebenezer Brown.

The town of Sudbury,[11] on March 26, 1677, granted to five inhabitants —Peter King, Thomas Read, Senior, John Goodenow, John Smith and Joseph Freeman—liberty to build a sawmill upon Hop Brook "at the place viewed by the committee of this town," in consideration whereof they were to have twenty tons of timber from the common lands with which to build the mill, and earth for their dam. A somewhat peculiar provision was attached to this privilege, which was that in case the corn mill was discontinued the owners of the sawmill should set up a corn mill and grind the town's corn, and upon failure to do this at any future time by them, their heirs, or successors, the land granted should be forfeited and returned to the town; also, they were "not to pen up the water, or saw at any time between the middle of April and the first of September, and they are also to make good all the highways they shall damage thereby."

There was a sawmill at Arlington some time previous to the year 1681, since in that year liberty was granted to the widow Rolfe "to make a dam above the old mill pond to keep water in" to provide the mill with water, and this liberty was used by her son-in-law, William Cutter, who made a dam in 1703 at that place to raise a pond for his sawmill.[12]

Jonas Prescott built the first sawmill in Groton in 1686.[13] He was granted the use of Stony Brook on condition that he would "accommodate the town with merchantable boards at sixpence a hundred feet cheaper than they were sold at any other sawmills, and for town pay, and that the town be supplied before any other persons, provided, always, the sawmill did not hinder the corn mill." Another mill was erected in Groton in 1772, according to an advertisement published in the *Boston Gazette* of September 30, 1773, in which it was stated that there would be sold at public vendue, on November 3, by George Pierce, "a valuable Farm

10 "History of Framingham," by Temple, 1887.
11 "Annals of Sudbury, Wayland and Maynard," by Hudson, 1891
12 "History of Middlesex County," Vol. I, by Drake, 1880.
13 "A History of American Manufactures," by Bishop.

in Groton, in the County of Middlesex. . . . Said Farm contains 172 acres of upland and Meadow, . . . with a large Dwelling House and Barn . . . and Sawmill, the latter new Last Year . . . in good Repair, and on a good Stream and within a few rods of the house."[14]

The exact date of the town of Ashland's first mill is unknown. A grist mill, sawmill and fulling mill was built in this town by a man by the name of Jones, who moved there some time between 1725 and 1730.[14] He probably built the mill soon after his coming.

SUFFOLK COUNTY.

Suffolk County probably contained sawmills at quite an early date, as among the various trades found in Charlestown, that county, between 1630 and 1650 were the following: Cutting of posts, clapboards and shingles, coopering, carpentering, shipbuilding and various kinds of millwork. There were wind, stream and tide mills in Charlestown in 1645.[15]

Of Boston, Johnson's "Wonder Working Providence" says: "Good store of Shipping is here yearly built, and some very fair ones; both Tar and Mastes the Countrey affords from its own soile; . . . this Town is the very Mart of the Land, *French, Portugalls* and *Dutch,* come hither for Traffique."

NORFOLK COUNTY.

Dorchester, Norfolk County, undoubtedly had the first mill in what is now Massachusetts, as a water mill, probably a sawmill, was erected there in 1633.[16] Seven years later the first water mill in Dedham was built, and in 1664 a sawmill was put up by Joshua Fisher on Neponset River.[16]

In one of the raids by Indians, that so frequently wiped out early settlements in the Seventeenth and Eighteenth centuries, in the year 1676, nearly fifty buildings and two sawmills at Medfield were destroyed by the Red men.[16]

PLYMOUTH COUNTY.

Regarding the section of which the present Plymouth County is a part—the section to which came the first English settlement in New England—there is much difference of opinion as to the date and location of the first sawmill. Most of the historians concede this honor to the mill erected at Scituate in 1656, or 1657 as some give the date. However, such is not the case, for a record dated 1640 mentions what was probably the first sawmill in that town,[17] and in 1653, three or four years previous to the Scituate mill of the historians, it is called the "old Mill." The town of Hingham, also, probably contained a sawmill some years, perhaps, before 1654, for during that year "Wonder Working Providence"

[14] "History of Middlesex County," Vol. I. by Drake, 1880.
[15] "Somerville Past and Present," by Elliot.
[16] "Massachusetts Historical Collections," Barber, 1848.
[17] "History of Scituate," by Deane, 1831.

spoke of the town in the following language, which implies the presence of a mill: "The Town of *Hingham*, . . . is situate upon the Sea coast South-east of the *Charles* River, being a place nothing inferiour to their Neighbours in situation, and the people have much profitted themselves by transporting Timber, Planke, and Mast for Shipping to the Town of *Boston*, and also Ceder and Pine-board to supply the wants of other Townes, and also the remote parts even as far as *Barbadoes*."

The next sawmill in Scituate of which record exists is the famous one of 1656 built by Cornet Robert Stetson, Mr. Hatherly and Joseph Tilden. The conditions by which this mill was to be erected are given in full in Chapter II of this volume. In Deane's "History of Scituate" it is stated that the remains of the dam of this mill were still to be seen, in 1831, "at the bridge near the house of the late Major Winslow."

In 1688, twelve years after the burning of this mill by the Indians, Benjamin Curtis built a sawmill on the same stream—Third Herring Brook—and above the pond of the old mill.[18] On or before the year 1690 a sawmill was built on Second Herring Brook by the family of Bryant.

"A History of American Manufactures" contains the following: "The King's Commissioners, who visited New England in 1664, reported the old colony of Plymouth to contain 'about twelve small towns, one sawmill for boards, etc.' The sawmill is believed to have been in Pembroke, then a part of Duxborough." Another authority says:[19] "Pembroke was originally a part of Duxbury and with that town was called Matakeesit by the Indians. Here was the first sawmill in Plymouth Colony and the only one in the colony for more than forty years after its settlement." Why the Pembroke mill should necessarily be the one referred to by the King's Commissioners, is not clear, since several mills had been put up by that time in Plymouth Colony; and to the statement that the mill in question was the only one in the colony for forty years after its settlement, exception may be taken, in view of the fact that other mills were mentioned in the old records already referred to.

The first sawmill built at South Abington, then called "Little Comfort," was in 1698.[20]

BRISTOL COUNTY.

The old town of Taunton, in Bristol County, had a sawmill at quite an early date, there being one in that town, on Mill River, in 1659, according to the *North American Review* of 1844, Vol. LVIII.

WORCESTER COUNTY.

Many of the mill streams of Worcester County were mere brooks, often quite dry, or at least not of sufficient volume to carry a mill during the dry

18"History of Scituate," by Deane, 1831.
19"Massachusetts Historical Collections," Barber, 1848.
20"Gazetteer of Massachusetts," by Nason, 1876.

season. A Mr. Wetherbee, who built corn and sawmills at Lunenburg, on the Nashua, one of the largest of these streams, in order to gain a constant supply of water dug a canal a mile in length, which, in those days, was considered an enterprise of uncommon occurrence.[21] Yet notwithstanding this lack of good water power, sawmills were numerous in Worcester County at an early date. Peter Whitney's history of the county, which was published in 1793, gives the following enumeration of sawmills at that time: Worcester 4, Mendon 2, Brookfield 6, Oxford 6, Sutton 6, Leicester 5, Rutland 4, South Borough 3, Shrewsbury 2, Harvard 1, Hardwick 4, Holden 6, Leominster 5, Douglass 1, New Braintree 1, Westminster 3, Princeton 5, Athol 5, Oakham 2, Fitchburg 1, Winchendon 6, Ashburnham 5, Northborough 4, Hubbardston 11, Northbridge 1, Ward 4, Milford 3, Boylston 1 and Gerry 4. The following towns also were mentioned as containing mills, but the number was not given: Lancaster, Westborough, Lunenburg, Grafton, Bolton, Spencer, Petersham, Charlton, Templeton, Paxton, Barre, Sterling, Berlin and Gardner.

The first white settlement in this county was made at Worcester in 1673 or 1674, but it had to be abandoned on account of the Indian hostilities during King Philip's War. In 1684 another attempt was made at settlement, Captain John Wing erecting the first corn and sawmill on the site of the present city of Worcester.[21] The remains of the dam for this mill were still visible in the Nineteenth Century.

The first mill in the town of Oxford, a sawmill, was put up previous to 1689.[22] A number of sawmills were early erected in this town, the exact dates not being known. Elliott Mill Brook in early times was larger than it is at present. A stream sufficient to run a sawmill issued from "Burnt Swamp," now drained and cultivated. The mill on this stream, built by Ruben Eddy, though dilapidated at the time, was operated later than 1820 by a man named Pope, but, eventually, it was torn down. A large pond, serving as a reservoir, was raised over the swamp by means of a dam. The east branch of Mill Brook, now nearly dry in summer, was at one time large enough to operate a good-sized mill at North Oxford Station village. A man by the name of Gleason, who died in 1732, had built a sawmill in Oxford. "Chase Mills No. 2," the lowest of two at North Oxford, in 1892 stood on the original homestead of Ebenezer Learned, who, as early as 1728, built there a sawmill which was operated by himself, his son and his grandsons for 100 years. The last of these grandsons, Jeremiah Learned, died in 1829. The mill continued in operation under different proprietors until it was burned in 1839. Caleb Lamb is believed to have erected one in 1735 or 1736. On the south branch of Mill Brook,

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[21] "A History of American Manufactures," by Bishop.
[22] "History of the Town of Oxford," by Daniels, 1892.

probably as early as 1750, Elisha Davis built a sawmill near his house, which he and the successive owners of the farm operated for more than a century. The last sawing was done there in 1865. The water power near the Leicester line was first used about the year 1754, when a dam and a sawmill were erected there by Uriah Stone. The Acworth mill, which was operated as a sawmill until 1811, was built shortly after 1752. In 1788 and 1792, respectively, Samuel Davis and John Hudson built sawmills on their own farms.

In Ashburnham, in 1737, Hezekiah Gates built a sawmill on a tract of ninety acres granted him for the purpose, on the stream between the Upper and Lower Naukeag lakes.[23] In return Mr. Gates gave a bond of £500, and was obliged to build and conduct the mill on the terms outlined in the vote of the proprietors. The term "proprietors," as used in these ancient records, means simply those to whom the land was originally granted for a settlement, or their successors, and has no reference to owners of a mill. The following from Stearns' history[23] may be found interesting:

> Both Mr. Gates and his mill were an endless source of perplexity and litigation. The proprietors continually complain of the construction and management, while he successfully understands their directions to raise the dam and make repairs, until the fact gradually develops that there is a better head on Gates than at his mill, and more revolving power in his mind than in his wheel.
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> In 1751 measures were adopted which led to the building of a new sawmill. In order to accomplish this desired result, the proprietors first declared their independence of Mr. Gates and his mill, and then, in the light of a discovery, came to the conclusion that the former grant of land to him is revoked and can be given by them to any other person or persons who will undertake to build another and a better mill. With the summary retirement of Mr. Gates, the old mill falls into decay, and the temper of the proprietors is reflected with more serenity in the pages of the records. Let it not be presumed that this continued trouble over the sawmill has been unduly colored in these annals. Only a few of the many complaints of the proprietors have been mentioned, and always with a conscientious effort to temper their acerbity.

The final vote in regard to this matter was passed on November 5, 1751, when was granted to Caleb Dana, Timothy Green and Jonathan Dwight and their heirs "the stream of water wherein the old sawmill was built by Hezekiah Gates, and the ninety acres of land, sixty acres [of] which are laid out near or adjoining to said stream, which was supposed to be granted to the said Gates. They viz.: Caleb Dana, Timothy Green and Jonathan Dwight build a sawmill and keep the same in good repair three years after said mill and a good dam is well finished at or before the 20th day of May next or sooner." Caleb Dana and Elisha Coolidge, settling at this time in Lane Village, near the city of Ashburnham, bought of Jonathan Dwight fifty acres of land adjoining the old sawmill grant. On this tract, in the year 1752, they built a sawmill. Mr. Gates' old mill

[23] "History of Ashburnham," by Stearns, 1887.

was located on the stream between the Upper and Lower Naukeag lakes, on the sawmill grant. Between this grant and the Upper Naukeag Lake was the lot of fifty acres on which the two mills were built by Dana and Coolidge in 1752.

The proprietors had located the first mills as near the center of the town as possible, but there were many settlers so far removed from these, the only mills in the township, that another one was built to accommodate these settlers, previous to the year 1758. The site of this mill is now in Ashby.

In 1772 the town of Ashburnham sold a part of a lot for a sawmill site for $18, and later, but before the Revolution, a saw and grist mill was erected upon this site, which was at the outlet of Rice Pond. Phillip Oberlock owned a sawmill in the southern part of the town, which he sold in 1778. Colonel Francis Lane erected a sawmill in 1786. Ezra Dana removed to this township about 1790, and built the first sawmill on the river at Burrageville.

In 1793, according to Whitney's history, a sawmill had been built on the Nashua.[24] It was probably in the year 1745 or 1746 that Deacon Amos Kimball and his cousin Ephriam settled within the limits of the present town of Fitchburg, when it was a part of Lunenburg. They built the first dam across the Nashua in this town, and there erected a sawmill and a grist mill. The second dam across the Nashua was built by Jonas Marshall and Deacon Ephriam Kimball in 1794, at which time they erected a sawmill. At quite an early period sawmills were built on several of the smaller streams in different parts of the town.

FRANKLIN COUNTY.

Northfield, Franklin County, was first settled in 1673, but two years afterward was abandoned on account of Indian depredations. A second attempt was made in 1685, when John Woodward, William Clarke, Junior, and Richard Lyman were granted the privilege of building a sawmill and given twenty acres of land as an encouragement.[25] The settlement prospered for a short time, but was deserted again upon the outbreak of King William's War in 1689. Following that war came Queen Anne's War, which continued until 1713, and Squakheag (the original name of the settlement) remained desolate. In 1713 some of the surviving proprietors, who had not as yet located permanently anywhere, petitioned the General Court for a revival of the former grant, which was ordered. The name of the town was changed to Northfield. Late in 1717 Jonathan Belding put up a sawmill.

There was probably a mill of some kind in Swampfield (now Sunder-

[24] "History of Fitchburg," by Torrey, 1865.
[25] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.

land) during the first settlement, for, under date of 1690, Major Pynchon referred, in a letter, to the fact that Indian attacks had been discovered about "old Swampfield Mill."[26] It is not known where this mill stood. In 1716 Daniel Beaman and others, of Deerfield, put up a sawmill on Sawmill Brook, probably in what is now Montague, a town formerly a part of Sunderland. This mill will be spoken of more fully under Montague. Several mills (probably both sawmills and grist mills) were authorized in 1722 and 1725. Manoah Bodman and others built a sawmill on Slatestone Brook.

At Deerfield lumber was at first sawed in sawpits. In 1690 mills were established.[27]

At Greenfield a sawmill was in operation in 1693, but how long it had then been sawing is not recorded. There were formerly in this town a number of sawmills on Fall River, and the village of North East was much resorted to for lumber.[28] A great number of logs were left by the spring floods, before they were sent by the canal, and, previous to the arrival of the lumbermen to set them adrift, were easily taken possession of and converted into boards and shingles. It is said that a considerable business was carried on in this way.

The earliest recorded grant of land in what is now Montague bears the date of March 23, 1716.[26] The "committee of Swampfield," consisting of Samuel Partridge and John Pynchon, granted to Benjamin Munn, Edward Alling, Junior, Daniel Beaman, Edward Alling and Nathaniel Frary the privileges of a stream in Swampfield, called Sawmill Brook, upon which a sawmill was erected. They were to have free privilege of timber in Swampfield on the north side of Sawmill Brook for the use of their mill. They were to sell "bords" to the inhabitants at a price not exceeding twenty shillings a thousand, and their grant was to continue only so long as they operated the sawmill. As an encouragement to build the mill they were granted thirty acres of land in some convenient place in Swampfield. This place was a tract on Sawmill Brook now in the Village of Montague Centre.

At a meeting of the proprietors of Bernardston, held at Deerfield in October, 1737, it was decided to raise £40 for the building of a sawmill on Fall River, near the meadow lands. A committee was appointed and instructed to have the mill set up by the following summer and to agree with Joseph Mitchell, or some other person, to do the work. It was conditioned further that the person setting up the sawmill should have the exclusive mill privileges of that part of Fall River only in the event of his setting up a grist mill for the benefit of the proprietors. In the fall of 1738 the first

[26] "History of the Connecticut Valley in Massachusetts," Vol. II, by Everts, 1879.
[27] "History of the Town of Oxford," by Daniels, 1892.
[28] "History of Greenfield," by Willard, 1838.

settlers arrived at Bernardston, at which time the sawmill was doubtless completed.[29]

About the same time—in 1737—a sawmill was built at Shutesbury on the south branch of Roaring Brook by Jonathan Burt, Bezaliel Wilder, Nathan Farrar and James Wilder, who were granted twenty acres of land and £50, as an encouragement.[29] They were to furnish the settlers with good pine boards at forty shillings a thousand for ten years, or "saw to the halves," or for twenty shillings, the settlers finding the logs.

The precise year when the first permanent settlement was made in the town of Ashfield is not known. It is believed that it was made in 1743.[29] A few notes from the "Proprietors Records" will best indicate the date of the first settlement, as well as show the measures taken by the proprietors to induce settlement and make it permanent. The following is dated May 28, 1741:

Voted that One hundred & twenty pounds be assessed on ye Proprietors, as an Incouragement to him or them yt shall build a saw-mill in some convenient place and Convenient to ye Lots allready Laid out; Provided, The Owner or Owners of said mill saw for the Proprietrs for the first seven years For twenty shillings per Thousand; Provided, also, that ye said miller or milleres, viz't, Owner or Owners, do keep said mill in ordr for business for seven years, and as he or they shall have water; & if said Proprietors do bring Logs, that he or they saw them as aforesd. Past in ye affirmative.

In May, 1742, it was

Voted that a good Whipsaw be procured at the Charge of the Proprietors and that Samuel White & Job Porter have said saw delivered to them for sawing bords for the Proprietors, Provided they saw sd bords for said proprs For four pounds old tenor per Thousand, and when said proprietrs shall Require the Return of the saw to them, or their Order, In Order and sound. Provided, also, that, viz't, sd White & Porter give Bond for Returning sd Saw in good Order and sound & soon as above said.

The vote to encourage a sawmill, etc., was rescinded September, 1742. On the same date, eighteen pence a pound was granted to Richard Elis "for a good iron Crank & gudgeon for a sawmill."

Sixteen acres of land lying near or at the end of Richard Allis' lot, together with the right of the stream called Bear River at that point, were appropriated to Nathaniel and William Church upon condition that they would erect and set up a sawmill there. In 1753 a sawmill stood upon Bear River.

At Charlemont Aaron Rice was the owner of a corn mill in 1753.[29] In May of that year the proprietors met at the mill to examine the work already done and to see what was necessary to complete the mill. After some debating, it was voted to give Mr. Rice a sum of money and have him build a sawmill also. For this purpose it was voted "to give said Aaron Rice the sawmill irons belonging to ye proprietors, and to compleat

[29] "History of the Connecticut Valley in Massachusetts," by Everts, 1879

the set, he engaging to build a sawmill on the brook he hath built his corn mill on, and to saw bords for the proprietors at ye same price, and sell bords at ye same prices that they are sold for at Deerfield, for ye space of ten years next ensuing." For the performance of these conditions and the faithful use of the money and the "compleat set of mill irons" Aaron Rice gave his bond for £100 and soon commenced grinding "for the sixteenth part," as was the custom in those days, and sawing "bords" at the customary price. The mill was swept away by a flood in 1775.

The proprietors of the town of Warwick in 1753 raised £50 to build a sawmill.[30] Ebenezer Locke contracted to build the mill, but was frightened from the undertaking by reports of Indian depredations at the place where he was to erect the structure, and abandoned the work. It was decided to prosecute him for his failure, but upon learning the reason, the proprietors relieved him of the obligation. A second attempt to put up the mill was successful and it was "got a going" in 1759. This mill was located on Black Brook.

Buckland was first settled about 1769.[30] Clessons River, in this town, afforded good water power, which was improved at an early date. Near the Hawley line, and at what was called the "Upper City," Silas Dodge had a sawmill, and, an eighth of a mile below, a member of the Ruddock family had one, also. J. T. Ward and others had early mills, as well. On Clessons River, near the village of Buckland, was one of the first powers to be improved. Here John Ward, who settled in Buckland in 1773, operated a good sawmill and a grist mill. Near the mouth of the same river, in the midst of a pine forest, was built a pioneer sawmill, previous to 1790, by Samuel Taylor, Josiah Johnson, Daniel Trowbridge and others. This was widely known as the "Pine Mill." After 1800 Levi White became its owner and continued to operate it for many years.

Prior to April 24, 1771, a great portion of the present town of Whately formed the northern part of the township of Hatfield, now in Hampshire County, and much of its early history is connected with that town. A few years after 1763 Mr. Taylor built the first sawmill, which became the property of Thomas Sander in 1803.[30] About 1765 Edward Brown put up a sawmill. About three years later saw and grist mills were erected on West Brook, which was one of the best streams for its volume in the State. Joshua Belden commenced to operate a small sawmill on Hopewell Brook in 1797.

Near the present village of Rowe, Artemus Ward settled about 1774, and built a sawmill on the brook which still bears his name.[30] The water power of Pelham Brook was utilized to good advantage, a sawmill being operated on it soon after the town was settled.

[30] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.

The first sawmill at Heath was built soon after the year 1800.[31]

The rugged nature of the town of Monroe did not attract pioneers, and, therefore, no attempt at permanent settlement at that place was made until about 1800.[31] The manufacturing interests of Monroe were limited by the water power of its single stream to the industry common to that part of the State—the manufacture of lumber.

In the year 1801 a solitary settler in a "howling wilderness" went to what is now Erving, from Heath. This was Colonel Asaph White, who, two years later, threw a dam across Millers River and built a sawmill.[31]

HAMPSHIRE COUNTY.

At Hatfield, in Hampshire County, Thomas Meekins and Robert Boltwood were authorized, on January 27, 1662, to set up a sawmill on the east side of Mill River. The mill seems to have been built in 1664 or 1665, and, when completed, it probably put an end in this vicinity to the old, slow and laborious process of pitsawing. Thomas Meekins is also said to have had a sawmill in 1669.[31]

The first mill in the present town of Hadley was for the manufacture of lumber.[31] It was located on Mill River and was put up about the year 1664. Previous to that time the inhabitants used boards made with pitsaws, or "riven boards," meaning cloven boards, hence clove-boards, cloboards, claboards and then clapboards. This first mill was continued until 1674. A grist mill and sawmill were in operation on Fort River, near the village of Hadley, in 1771.

As early as 1671 the town of Northampton had a sawmill in operation.[32] Ten years later, at a town meeting held January 2, 1681, Richard and Thomas Lyman, Samuel Wright and Samuel Parsons asked permission to erect another sawmill in the town. The request was granted on the condition that it should be built within a twelvemonth and do no damage to the corn mill on the same stream, and that when the mill was given up the place should revert again to the town. The records seem to indicate that the mill was erected within the specified time, and that it stood on the west bank of Mill River in what is now the village of Florence. It is believed that John Hulbert bought this mill about 1709. From 1726, or earlier, down to as late as 1811 this sawmill was "called and well known by the name of Hulbert's Mill."

Permission to erect a sawmill in Easthampton was given to David Wilton, Medad Pomeroy and Joseph Taylor in 1674.[31] There is no absolute proof that the mill was erected. Upon the small tributaries of the Manhan flowing from the north there seem to have been no mill privileges improved except on the one known as Sawmill Brook, upon which, near

[31] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.
[32] "History of Florence," by Sheffield, 1875.

the Northampton line, there was a sawmill dating back to 1803. This mill was destroyed in the flood of 1854.

In 1684 four men had liberty granted them to set up a sawmill in Granby at the falls of Bachelor's Brook.[33] What mills were erected under these grants is not known. In the proprietors' records of 1721 and 1722 the "old mill place" on Bachelor's Brook is mentioned, also the "old mill-pond" on Stony Brook below Smith's grist mill, and a sawmill below the pond. "John Preston's mill" is mentioned on the town records as early as 1771. It stood on Bachelor's Brook in the northern part of the town and possessed both saw and grist mills.

In 1730 Captain Jabez Olmstead built two mills on the falls at Ware, a sawmill and a grist mill.[33] In April, 1813, these mills were repaired and operated. In 1765 a grist mill and sawmill stood on the falls at the village of Ware, which were extensively known as Magoon's mills.[34]

At Southampton, on March 15, 1732, liberty was given to Deacon Clark, Joseph Wright, Ebenezer Sheldon and Jonathan Strong to set up a sawmill either upon Great Brook at the falls, or below upon Manhan River, on condition that they have the mill ready for sawing before the following winter.[33] In the northwestern part of the town, on the west branch of the Manhan, was the Parson's sawmill, dating back, perhaps, to nearly the first settlement.

The first saw and grist mill at Greenwich was built about the year 1745, by a man named Holmes.[33]

Joseph Burnell built the first sawmill in Chesterfield, it is supposed, perhaps as early as 1761.[33] The crank for the water wheel and the iron rack wheel were brought by a negro on his back from Northampton. Kidd Wright built a sawmill about 1777, or a little earlier. Lieutenant Robert Damon built a sawmill previous to 1773 upon the site of the present Bisbee mills. This was probably the first sawmill on that site.

Goshen had a sawmill within a few years after its first settlement, which was in 1761. The mill stood on Dresser Brook and was owned by Reuben Dresser.[33]

At South Worthington was an ancient sawmill, dating back, perhaps, to the first settlement of the town, in 1763 or the following year.[33] This mill was destroyed by fire and rebuilt about 1829. On Ward's Creek was another early sawmill in this town, erected about 1765 or 1767.

On September 26, 1764, the town of Cummington voted that there be two sawmills erected in Township No. 5 (Cummington), one at the east end and one at the west end, with a grant of 100 acres to each of those who would undertake to build them. For this purpose 100 acres was voted

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33 "History of the Connecticut Valley in Massachusetts," by Everts, 1879.
34 "History of Ware," by Hide, 1847.

to John Cummings, who was to have a mill ready to work by the following July. One hundred acres was also voted to Charles Prescott to build a sawmill at the east end of the township within twelve months. From the report, Charles Prescott seems to have built, in the summer of 1766, the mill which John Cummings was to have built; but this is not sustained by tradition.[35] A sawmill was built in 1797, but was swept away in a flood. Judging from the town records and from the traditions of the people at the time Everts' history was published, it is difficult to distinguish among three of the most ancient sites, and it seems likely that they were all occupied at about the same time—from 1765 to 1770.

The dam at the lower village of Enfield was built previous to the year 1770 by Ephriam Woodward, who erected a sawmill there.[35] The dam at the upper village was erected in 1812. There was also a sawmill at this place at an early date.

On Beaver Brook, in the southeastern part of the town, was the first sawmill erected in Williamsburg Township, supposed to have been put up in 1770. On Joe Wright's Brook, also in the southeastern part of the township, was an early sawmill, dating back, probably, to the first settlement of the town. Other early sawmills were located in the southern part of the town (on Unguomonk Brook) and on the main stream of Mill River above the village of Williamsburg. At the present site of Haydenville, in the same township, a sawmill was erected in 1785. It was still standing in 1824, but was soon afterward removed. Another sawmill was built in this village in 1837, but was burned ten years later.

In the year 1806 a sawmill was in operation at Pelham.[35]

HAMPDEN COUNTY.

Agawam, Hampden County, was originally a part of the town of Springfield, and, therefore, its early settlement and history are detailed in the history of that town. In the first volume of the book of grants of the town of Springfield is found the following record:[35]

> There is granted unto Samuel Marshfield, Thomas Noble, Thomas Miller, and Elizur Holyoke, upon their desires, liberty of ye setting up of a sawmill on a brook below Ensign Cooper's Farm, over Agawam river. Also there is granted them about 40 acres of land where they shall choose it, near the place where the mill shall stand, not prejudicing any of ye Inhabitants property on the Highway. Also there is granted them 30 acres of meadow within 2 or 3 miles of ye place, where they shall find it most convenient for their use, beginning at one end of the meadow and so proceeding till 30 acres are made up. These grants are on condition that they cause a saw-mill to be set up in the places above mentioned, and set to work for sawing by the first day of April, which shall be in ye year 1666.

It was further conditioned that, in case they deserted the mill within three years, the lands should revert again to the town, or to others who

[35] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.

should carry on the work. They were to have free use of "all sorts of Timber" on the commons. This mill is supposed to have been where the Farrar mills stood in 1879, on Three Mile Brook, as Thomas Cooper had grants of land on Three Mile Brook and its east branch as early as 1659 and 1660.

Major John Pynchon had sawmills in operation in the present Hampden County, then included in Hampshire County, at the breaking out of King Philip's War in 1675. Many of the settlements in the Connecticut Valley were deserted, and were burned by the Indians, among them being Brookfield, in Worcester County; Northfield, Deerfield and Swampfield or Sunderland, all in Franklin County, and Suffield, now in Connecticut, but then in Massachusetts. Springfield was burned October 5, 1675. Major Pynchon's letter to his son Joseph, describing that event, says: "All my mills, both corn and saw-mills, are burnt down; those at home, in this town, and also those I had in other places." Major Pynchon's sawmill near the mouth of Stony Brook was destroyed at this time and rebuilt in 1677.[36] Major John Pynchon's name occurs with such frequency in the records of the Connecticut Valley that he seems to have been the leader in commercial enterprise and undertakings in the early days, especially those connected with lumbering. In the commercial parlance of the present he would be called a "Lumber King."

The records say that in December, 1672, Joseph Whiting, Thomas Dewey, Josiah Dewey and Jedediah Dewey finished the building of a sawmill and corn mill on Two Mile Brook at Westfield, and that they proposed to manage the concern in partnership. In 1680 Lieutenant Moseley, Thomas and Sargent Dewey were granted permission to erect a grist and saw mill on Two Mile Brook at its mouth. After this sawmills began to multiply rapidly.[37]

The following minutes, taken from the proprietors' records, will prove of interest as indicating the erection of the first sawmill in the town of Palmer:[37]

On Tuesday the 3d day of September 1730, the foundation of the dam on the northeast corner of Potaquatick [Brook] was laid; on the 14th day of October 1730 Potaquatick Saw-Mill was raised; and on the 5th day of March, next after, the saw mill first went; on the 13th day of December 1732, the said mill was burned down. It stood, after it was raised, two years and two months, wanting one day. After it first went it stood but one year, nine months and eight days. The second sawmill at Potaquatick pond, rebuilt on the same spot, viz.: it was raised on the 8th day of October, 1733, and first went on the 6th day of November 1734, and on the 26th day of April 1736, it was undermined by the water, and broken down after it stood two and one-half years; and after it first went one year and five months. The third sawmill, built on a new spot, was raised the 20th of September 1736, and first went on the 5th of May 1737.

[36] "Documentary History of Suffield," by Sheldon.
[37] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.

The first sawmill in the town of Hampden was built by Lewis Langdon in 1750.[38] At the "turn of the river," so called, was the sawmill of Captain Charles Sessions. After it fell to pieces another mill was erected on the north side of the river about the middle of the Nineteenth Century. Milton Stebbins erected a grist mill and sawmill south of the bridge on the east side of the mountain.

In 1766 two sawmills and a grist mill were erected at Chester, in Hampden County.[38]

Azariah VanHorn and a Mr. Chapman built a sawmill at Chicopee prior to 1770. It was supplied with logs floated down the Connecticut, principally, though some came down the Chicopee. The lumber not needed for home consumption was rafted to Hartford and Middleton and exchanged for supplies and merchandise.[38]

A saw and oil mill was located in the latter part of the Eighteenth Century at Monson.[38] The sawmill was in operation as late as 1822. A saw and grist mill stood in this town as early as 1800, and was taken down in 1816. Several sawmills existed in different localities in the town early in the Nineteenth Century.

BERKSHIRE COUNTY.

A sawmill was erected by a few individuals in Becket in 1740. On account of fear of the Indians the mill was abandoned, and not until fifteen years later was a permanent settlement made.[39]

Colonel Williams, the founder of Williams College, in 1750 obtained from the General Court a grant of 200 acres at Adams, Berkshire County, on condition that he should reserve ten acres for the use of a fort and build a grist and saw mill and keep them in repair for twenty years for the use of the settlers.[40]

At Pittsfield, in 1753, Deacon Crofoot, who seems to have been an active and enterprising man, asked the plantation to exchange that portion of the school lot which contained the water privilege later occupied by the Pittsfield Cotton Mills, for a section of his home lot, which adjoined it on the east, for the purpose of erecting a grist mill and a sawmill.[41] The Deacon also wished to know what the proprietors would give him for setting up the mills. But the record curtly informs us that the meeting refused either to make the proposed exchange or to "give Deacon Crofoot anything for setting up the mills." It is not well explained why the plantation did not encourage an enterprise which seems to have been so much needed, as the nearest point at which farmers could have their grain ground was Great Barrington, twenty-one miles distant, and it does not

[38] "History of the Connecticut Valley in Massachusetts," by Everts, 1879.
[39] "History of Western Massachusetts," by J. G. Holland.
[40] "Historical Collections of Massachusetts," by J. W. Barber, 1848.
[41] "History of Pittsfield," by Smith, 1869.

appear how sawed lumber could be obtained at all within any practicable distance. But Deacon Crofoot, though he afterward built his mills, never seems to have been a popular miller.

In 1762 Joseph Keeler purchased 240 acres of Colonel Williams' great pine tract on the south shore of Pontoosuc Lake, not far from the village of Pittsfield, and extending forty rods down the outlet, upon which he built a saw and grist mill.[42] About the same time a sawmill was erected at Coltsville, in Pittsfield Township. About 1767 saw and grist mills were put up by Ezra Strong and others. A sawmill was early built where the Pontoosuc Factory later stood, and previous to 1776 another at Wahconah, in connection with a fulling mill owned by Deacon Matthew Barber.

About 1771 Nathan Fisk, who was among the first settlers of Hinsdale, Berkshire County, built a grist mill and a sawmill, for which he received a premium from the Government of 250 acres of land.[43]

[42] "History of Pittsfield," by Smith, 1869.
[43] "Historical Collections of Massachusetts," by J. W. Barber, 1848.

CHAPTER XV.

MASSACHUSETTS—FOREST LEGISLATION.

The growth of forestry legislation is portrayed herein by verbatim selections from the statute books of the Province of Massachusetts and the State of Massachusetts from 1781 forward, together with condensed statements of the purport of some of the less important. These excerpts have been arranged chronologically and have been made particularly complete for the period covering the colonial history of the present State.

In previous chapters reference has been made to laws or executive regulations concerning the management of timber within the colony. These, together with a summary of legislation during the Seventeenth Century, give a correct view of governmental policy and public sentiment, conflicting as they often did, during that period. The summary referred to is by a lumberman of Boston,[1] who has given much sympathetic study to the historical aspects of the business in which he is engaged.

He says that when our forefathers landed on these shores, the country was an almost unbroken forest. The sun never shone upon a land so munificently supplied with timber adapted to the wants of mankind. They came from a country that a thousand years of man's occupation had used and destroyed about all the forests. At first the colonists were careful and enacted stringent laws. The early colonial records both of Massachusetts and Plymouth contain regulations concerning field and forest fires. July 26, 1631, it was ordered "That any person within the limits of our patent who shall burn ground before the first of March, shall be subject to such penalty as the Court shall inflict, and if any person desire to burn ground for corn, and it do any damage he shall make full satisfaction." November 5, 1639, it was further enacted: "That for setting fires without presently putting out the same, so that it do no damage, shall besides paying all damages, pay 40 shillings and if the party, he or she be not able to pay, they shall be punished by whipping, or such other corporal punishment as the Court shall order." November 6, 1649, it was enacted that any person setting fires in the woods before the tenth of the first month, or after the last day of the second month, or the last day of the week, or Lord's day, "shall pay all damages or half as much into the common treasury." The Plymouth Colony ordered that any person who set fire to the woods should pay ten shillings to the Govern-

[1] Mr. John M. Woods.

ment or be whipped. Later, an act was passed reciting that great damage had been done to the land and much fence destroyed, and it was provided that any person setting fires in common lands, without first getting leave from the town or proprietors, by a majority vote, at a meeting appointed for the purpose, should be liable to a fine of forty shillings to the benefit of the party suing, and also to a further action for damages. If done by a minor, his parent or guardian was liable.

Thus far Mr. Woods is quoted. Proceeding to a consideration of legislation following the opening of the Eighteenth Century, we find that the following act was passed in 1715:

Whereas there has been waste and stroy made of pine trees, and other timber within this Province: For prevention whereof,

Be it enacted by His Excellency the Governor, Council, and Representatives, in General Court assembled, and by the authority of the same,

That from and after the publication of this Act no person or persons may presume to cut or carry off any tree, trees or timber, bark or box any pine-tree or trees, for the drawing of Turpentine, standing upon any of the lands belonging to this Province, proprietors, townships or particular persons, without leave or license first had and obtained from the owner or owners thereof; on pain of forfeiting and paying the sum of Twenty-Five Shillings, for every tree so cut or removed, barked or boxed. And the Turpentine drawn from them, when found either in the trees aforesaid, barrels or other vessels lying upon the said lands, to be alike forfeited; one moiety thereof to the respective owners of the land and trees, the other moiety to be to him or them that shall inform or sue for the same, before any Justice of the Peace in the county where the offence is committed, if the forfeiture exceed not *Forty Shillings*, but if above that value, in any other His Majesty's Courts of Records, within this Province.

FOREST LEGISLATION UNDER STATEHOOD.

Following the Revolution, the new State of Massachusetts took prompt measures for the regulation of the timber business and the lumber trade, not only within its own borders, but in its magnificent timber District of Maine. That was a resource of great value, and it must be admitted that it was exploited more for the benefit of the State than of the District. Numerous grants of Maine lands were made to educational institutions in Massachusetts, and, as is told in a previous chapter, by 1820, when the District was admitted to the Union, the process of alienation of public lands had been far advanced, not more than 14,000,000 acres remaining; and by the terms of the separation these were divided between Maine and Massachusetts, both of whom proceeded promptly to dispose of them. This matter will be found treated at length in Chapter II.

April 28, 1781, an act was passed "to prevent Damages being done upon the improved Lands adjoining the Connecticut River, by Reason of Timber being left thereon, by the Spring Floods; and for fixing a Time for the Owners to remove it."

SURVEYORS' ACT OF 1783.

Aside from a few minor and local enactments, the forerunner of all American systems for the measurement and inspection of lumber and other forest products is found in a Massachusetts act of July 12, 1783. It provided for the election, in every town and district in the Commonwealth, at the annual meeting in March, of "Surveyors and Measurers of boards, plank, timber and slit-work, and Surveyors of shingles, clapboards, staves and hoops, . . . and the buyer shall pay to the Surveyor Six Pence per thousand feet, for viewing only, and Six Pence per thousand feet more for measuring and marking, and so in proportion for a lesser quantity."

Section 2 provided that pine boards exported to foreign countries should be square edged, not less than one inch in thickness and not less than ten feet in length. If they did not meet these requirements they were to be "forfeited to the use of the town where they shall be shipped."

Section 3 provided for the dimension of shingles, clapboards, staves and hoops as follows:

All shingles shall be split cross ways of the grain, and be eighteen inches long, unless those made for home use; pine shingles shall be free from sap, and all shingles shall be free from shakes and worm-holes and shall be half an inch thick at the butt-end, when green, and full three-eighths of an inch when thoroughly seasoned, if for exportation to a foreign market, and not less than one-third of an inch thick at the butt, when fully seasoned, if for home use, and four and one-half inches wide on an average, and none less than three inches wide, and shall hold their width three-fourths of the way to the thin end, and be well shaved, and each bundle shall contain two hundred and fifty shingles, or if bound in square bundles shall contain twenty-five courses, and measure twenty-two inches and a half at the lay: And in case there shall be more than five shingles in any one bundle that are under the above length, breadth or thickness, or five short in the tale of any one bundle of two hundred and fifty, the bundle which is so deficient, or in which such shingles are contained, shall be forfeited, and the shingles in each bundle which are not merchantable, shall be burnt, and the residue sold, and the money arising from the sale shall be paid into the hands of the Town Treasury for the benefit of the poor in such towns where the shingles are condemned, first deducting therefrom the cost of culling and surveying. And all white-oak butt staves shall be at least five feet in length, and five inches wide, and one and a quarter inches thick on the heart, or thinnest edge, in every part thereof. And all white-oak pipe-staves shall be at least four feet and eight inches in length, four inches broad in the narrowest part and not less than three-quarters of an inch thick on the heart or thinnest edge. And all white-oak hogshead staves shall be at least forty-two inches long, and not less than one-half inch thick on the heart, or thinnest edge. And all white-oak barrel staves, for all foreign markets, shall be thirty-two inches long; and for home use, shall be thirty inches long; and all shall be half an inch thick on the heart or thinnest edge. And all white-oak hogshead and barrel staves, shall be at least, one with another, four inches in breadth, and none less than three inches in breadth in the narrowest part; and those of the breadth last mentioned, shall be clear of sap; and all red-oak hogshead and barrel staves, shall be the same length, width and thickness,

with the white-oak, hogshead and barrel staves above mentioned; and all staves shall be well proportionably split. And all pine clapboards that shall be exposed to sale, shall be made of good, sound timber, clear of sap; and all clapboards shall be free from shakes and worm-holes, and of the following dimensions, viz.: Full five-eighths of an inch on the back or thickest part, five inches wide, and four feet six inches long, and they shall be straight and well shaved. And all hogshead hoops that shall be exposed to sale, or exported, shall be from ten to thirteen feet in length, and shall be made of white oak or walnut, and of good and sufficient substance, well shaved; those made of oak shall be not less than one inch broad at the least end, and those made of walnut shall be not less than three-quarters of an inch broad at the least end; each bundle shall consist of thirty hoops; and all hoops of ten, twelve and thirteen feet respectively shall be made up in distinct bundles by themselves; and if any hoops are packed of less dimensions than those prescribed by this law, or if any bundle shall contain less than thirty hoops, such bundle shall be forfeited and sold for the benefit of the poor of the town where it is offered for sale.

Section 4 provided that the surveyor of shingles and clapboards should be allowed six pence a thousand for surveying and telling, and the shingles were to be surveyed and measured before sent from the town where made, "and the town brand set upon the hoop of the lumber;" all shingles not surveyed and marked were to be forfeited and sold. This section further provided that two or more suitable persons should be chosen for each maritime town before December 12 following, and forever after at the annual meeting in March, to be viewers and cullers. Their compensation was to be as follows:

1s 8d a thousand for barrel staves.
2s a thousand for hogshead staves.
2s 4d a thousand for pipe staves.
2s 8d a thousand for butt staves.
3s a thousand for hoops.

Section 5 provided that after the 10th of December following all staves and hoops exported should be culled, viewed and surveyed and certificate given to the commander of the ship, by the culler or surveyor, of the quantity he culled or surveyed. The bands of the bundles were to be sealed with the brand of the town shipping them. Shingles and clapboards exported were also to be certified. Any one selling boards, staves, hoops, clapboards or shingles and delivering them before culled or surveyed was to forfeit twelve shillings a thousand, and any one purchasing same before culled or surveyed was to forfeit twelve shillings a thousand.

Section 6 provided that the master or owner of any vessel, having any of the above named articles on board for exportation, should make oath and a certificate thereof that the article had been culled or surveyed and a certificate should be transmitted to the naval officer.

Section 7 provided a penalty of twelve shillings a thousand to be paid by any one attempting to ship boards, staves, hoops, clapboards or shingles before having been culled or surveyed.

Section 8 imposed a penalty of £10 to be paid by any culler or surveyor guilty of fraud or deceit in culling or surveying.

Section 9 imposed a fine of twenty shillings for the failure of a surveyor or culler to take the oath of the faithful discharge of his office.

Section 10 repealed all former acts "made for the admeasurement of boards, and for regulating the tale and dimensions of shingles, clapboards, hoops and staves."

PROTECTION OF WHITE PINE TIMBER.

During the same year (1783) in which the above statute was enacted, the General Court took steps to prevent the illicit felling of large white pine growing on public lands. On October 24 an act was passed, as follows:

An Act to Prevent the Destruction of White-Pine Trees in this Commonwealth.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same,

That if any person, after the publication of this Act, shall cut, fell or destroy any white-pine tree, which is, or shall be at the time of felling or destroying the same, of the diameter of twenty-four inches or upwards at twelve inches from the ground, growing or standing on any tract of land within any part of this Commonwealth, not the property of any private person or persons, without license first had and obtained for so doing, from this Legislature, or by aiding and assisting thereof, or for drawing away the same after so cut or felled, he shall forfeit the sum of *Thirty Pounds*, to be recovered by bill, indictment or information, in any court of record in this Commonwealth proper to try the same, two-thirds thereof to the use of this Commonwealth and one-third thereof to the informer; and the sum of *Three Pounds* for any other white pine tree on the land aforesaid, to be recovered as aforesaid, and to the use before mentioned; provided such prosecution be commenced within two years from the time when the offence shall be committed.

In 1784 an act was passed intended to strengthen the surveyors' act of the previous year. It had chiefly to do with the control of shipments by vessel, and a curious provision was that any port or place not within the Commonwealth was to be considered a foreign market so far as the restrictions in shipping were concerned. In Section 5 of the act an allowance was made for the drying and shrinking of pine boards. In 1786 another and minor amendment was enacted.

Already the experience of the Commonwealth had demonstrated the need of protecting property in the shape of logs, masts, etc., floating or being in the streams of the State. Consequently, on February 22, 1794, an act to secure such property was passed. It will be observed that special reference was made to a river in Maine, and that the act did not apply to the Connecticut or Merrimac rivers. A portion of the text of this act is as follows:

PROTECTION OF PROPERTY IN FLOATING TIMBER.

AN ACT TO SECURE TO OWNERS THEIR PROPERTY IN LOGS, MASTS, SPARS AND OTHER TIMBER, IN CERTAIN CASES.

Whereas many persons put their logs, masts, spars, and other pieces of timber, marked with their marks, into the rivers of this Commonwealth and into the ponds and streams leading into such rivers, which marks are frequently cut out, altered or destroyed, to the injury of the owner; to prevent which wrongs,

Section 1, *Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same*, That if any person or persons shall cut out, alter or destroy any mark or marks of any owner or owners, made on any logs, masts, spars or other timber, put into any of the rivers, ponds or streams, within this Commonwealth, as aforesaid, on conviction thereof, such offender or offenders, shall forfeit and pay a fine of *Forty Shillings* for each log, mast, spar or other piece of timber, the mark whereof he or they shall be convicted of having so altered or destroyed; and shall be further liable to pay to the owner or owners of such logs, masts, spars or other piece of timber treble the value thereof; which fine and treble value shall be recoverable by such owner or owners, by action or trespass, in any court proper to try the same, with legal cost of suit.

Section 2 provided that if any such marks should be cut out and the owners of the property should be unknown the offending person should forfeit the sum of forty shillings, and legal costs, for each log, mast or spar so altered, to the person who should sue for the same.

Section 3 provided that any person taking, disposing or sawing or otherwise destroying a log, mast, spar or piece of timber belonging to another, without his consent, should forfeit to the owner for each piece treble the value thereof with costs of suit.

Section 4 provided that any piece of timber carried by the floods to lands adjoining streams could be removed from the land by the owner within eighteen months, upon his offering to pay the possessor of the land suitable damages; but if the owner of the timber should not take the same away within the time specified or otherwise agree with the owner of the land, then the timber should be deemed the property of the land owner.

Section 5 provided that whenever logs, masts, spars or other timber should be taken up and secured for the owner below the great boom in Saco River, the person so securing the logs should be entitled to one-sixth part of the same if taken up above the lower falls on said river and below said boom; or if taken up below said lowest falls on Saco River one-third part of the timber so secured, provided that the persons securing the same should advertise the logs, masts, spars or timber, describing the same and the marks, within seven days after securing them, by posting up advertisements in public inns; but if no such advertising should be posted up, the owner could take the whole without paying any sum for their having been secured. If no one should appear to demand his boards within three months from the day advertised, then the whole should become the property of the one who secured the same, and any person in any way disposing of said logs, masts, spars or timber within three months from the time of their being taken up and advertised, unless he

purchased the same of the owner, should be liable to pay the owner treble the value, with costs of suit.

Section 6 provided that any person could be prosecuted for a breach of this act if any logs, masts, spars or timber were found in his possession with the marks cut out or altered, unless he could give reason or satisfaction to the Court that he did not alter or deface the marks.

"*Provided nevertheless*, That nothing in this act shall be construed to the Connecticut River or the Merrimack."

DUTIES AND LIABILITIES OF DAM OWNERS.

During the colonial history of Massachusetts the problems involved in the control of streams had been recognized in legislation; but the new State found it necessary to revise the old laws and to cover new points by a comprehensive act, which was passed February 27, 1796. So important was this measure in its bearing on the lumber business, not only in Massachusetts and its District of Maine, but in other timbered states as well, being, as it was, the prototype of similar legislation the country over, that we give it somewhat at length. It also, as its title would suggest, had to do with the operation and business control of mill properties. The act began as follows:

AN ACT FOR THE SUPPORT AND REGULATION OF MILLS.

Whereas the erection and support of mills to accommodate the inhabitants of the several parts of the State, ought not to be discouraged by many doubts and disputes; and some special provisions are found necessary relative to flowing adjacent lands and mills held by several proprietors: Therefore,

Section 1, *Be it enacted by the Senate*, etc.

That where any person hath already erected any watermill on his own land or on the land of any other person, by his consent legally obtained, and to the working of such mill it shall be found necessary to raise a suitable head of water; and for so doing any lands shall be flowed not belonging to the owner of the mill, it shall be lawful for the owner or occupant of such mill to continue the same head of water to his best advantage for the mill and on the terms hereinafter mentioned.

Section 2 provided that any person sustaining damages by having his land flowed could complain to the Court of Common Pleas, which would issue a warrant directing the impaneling of a jury. "Which jury shall be sworn to make a true and faithful appraisement of the yearly damages done to the complainant by such flowing of his lands, and how far the same may be necessary. And said Jury shall try the cause; and their verdict being returned by the officer to the same Court, and there allowed and recorded, shall be a sufficient bar to any action to be brought for any such damages."

In Section 3 it was provided that such verdict should be the measure of the yearly damages until the owner of the mill or the owner of the lands overflowed should make a new complaint and obtain an increase or de-

crease of the damages. The party entitled to such yearly damages could have "an action of debt grounded and so recorded to recover the same. And the party prevailing in any complaint for action aforesaid shall be allowed his full legal costs when the damages so assessed or debt recovered shall not amount to the sum of Four Pounds."

Section 4 provided that in case the owner or occupant of such mill neglected or refused to give security as ordered by the Court, "he shall have no benefit of this Act, but shall be liable to be sued for so flowing the lands of the complainant or plaintiff in the same manner as though this act had not been passed." The jury was also to inquire and make return in of their verdict, "what part of the year the lands should not have been flowed; and during such portion of the year as the said Jury shall certify in their verdict that the public convenience and circumstances of the case do not justify such flowing, and the said verdict being acceptable by the Court, this Act shall in no manner authorize the said owner or occupant of such mill to flow the said lands of others."

Section 5 authorized proprietors of any mill, "worked by wind or water," needing repairs or rebuilding to call a meeting to consult about the repairing or rebuilding. When notification had been given to any proprietor, not more than thirty days and not less than ten days before the day of the meeting should be deemed sufficient notice.

Section 6 provided that any proprietor who had been notified and who neglected to attend the meeting, or who refused to agree with the majority of the proprietors interested to pay his part of the charges, was subject to be sued for his proportion.

"*Provided*, That nothing in this Act contained shall be construed to make void any particular contract made or to be made for the repairing or rebuilding of mill or mills."

Section 7 provided that the guardian of a minor, etc., having an interest in a mill should be deemed as the proprietor for the purposes of the act.

March 10, 1797, an act was passed putting a fine of $10 upon any one willfully setting fire to woodlands, and making such offender liable to damages.

On February 28, 1798, was passed an act in addition to the above act of 1796, for the "support and regulation of mills," beginning as follows:

> Whereas in said Act no provision is made for ascertaining the right of owners or occupants of mills to flow the lands of others without payment of any sum, by way of damages therefor, or for trying the title of complainants, therein mentioned, to the lands for flowing of which they may complain, therefore, *Be it enacted*, etc.

Section 1 provided that any person sustaining damages by his lands being flowed should complain to the Court of Common Pleas, and that the

Court should order complainant to notify the owner or occupant of the mill by serving him with a copy of the complaint fourteen days before the next term of court.

Section 2 enacted that if the owner or occupant of a mill in his plea should dispute the statement made by the complainant or deny his title to the damaged lands or to claim a right to flow such lands without payment of damages, the Court should order a trial.

Section 3 provided that if the owner, after being notified should not appear and not show sufficient cause the Court should issue a warrant. "And such proceedings shall be had in all things, as are prescribed by the act to which this is an addition."

Section 4 provided that the complainant should pay the costs if cast.

On March 4, 1800, an act was passed in addition to the above act of 1798. Section 1 provided that the owner or occupant of a mill dam might offer to the owner of the land overflowed any sum of money instead of yearly damages, within one month after the past year's damages had become due. If the owner should not accept the same but should present a new complaint he should not be entitled to the costs thereon unless he should obtain an increase of the sum tendered.

Section 2 provided that the owner of the lands overflowed could offer the owner of the mill dam "to receive of him any proportion of the sum established as his yearly damages, by reason of said overflowing, within one month after the past year's damages shall have become due."

On June 16, 1801, another act was passed in addition to the above act, which was found "by its operation to be insufficient to answer purposes intended thereby so far as it respects Saco River in the county of York."

Section 1 of this act provided that any logs, masts, spars or other timber carried by the floods into improved lands could be removed by the owners thereof at any time within three years on paying the owner of the land reasonable damages; and if the owner did not appear to remove the same within three years then they were to be deemed the property of the owner of the land.

Section 2 provided that when any logs, masts, spars or other timber were carried upon unimproved lands the owners could at any time remove them on paying the owner of the lands reasonable damages.

Section 3 provided that if any person fraudulently marked any logs, masts, spars or other timber, put into any of the rivers, streams, or ponds of the Saco River, upon conviction thereof, should forfeit $6 for each log, mast, spar or other timber so marked and should be further liable to pay the owner treble the value thereof with legal costs of suit.

Section 4 provided that any log, mast, spar or other timber stopped in Saco River by an obstruction in the river, should be removed by the owner

thereof, provided that nothing in the act should extend to logs, etc., forfeited before the passing of the act.

An additional act was passed on June 20, 1804, repealing the clause in the original act which read "That nothing in this act shall be construed to extend to the Connecticut River or the River Merrimack" and extending its provisions to the Connecticut River and the Merrimac.

On March 14, 1805, an additional act was passed providing that when logs, masts, spars or other timber should be secured for the owner "at the bridge called *Springs Bridges*, between Biddeford and Saco, below the Great Boom, so called, and above the lower falls of the *Saco*," the proprietors of the bridges in securing said timber should be entitled to one-fourth part of the same, and should advertise the same and proceed according to regulations and conditions described in the original act.

On February 28, 1807, an additional act was passed to the original act of February 22, 1794.

Section 2 provided that if any proprietors of booms in the Saco River should unnecessarily detain any logs, masts, spars or other timber they should forfeit to the owners of such timber $2 for each log, mast or spar so detained, provided such detention did not exceed six days.

Section 3 provided that the owner of any logs or timber should have liberty at all times to enter any mill or boom in search of any logs or timber suspected to be there, and any person attempting to prevent such search should be fined not less than $25 nor more than $100.

Section 4 provided that logs, masts, spars or other timber whose marks were so defaced as to be unknown should be turned from and through the several booms of the Saco River until they arrived at the Saco boom, the proprietors of which should carefully raft the same by themselves and on the first Monday of August in each year the same should be offered at public auction. The proceeds of the sale should be appropriated to the removing of obstructions to the passage of logs in the Saco River. Any person not the owner who should take or mark anew any such log, mast or spar should forfeit the sum of $25.

Section 5 provided that if the proprietors of the booms permitted any of the logs or other timber whose marks were defaced to be disposed of in a manner different from the provisions of this act, they should be fined not less than $25 nor more than $50 for each mast, log, spar or other piece of timber so disposed of, with legal costs.

Section 7 provided that "each and every of the duties, liberties, exceptions, fines, forfeitures and penalties, and every other part and provision in the foregoing act, and in the acts to which this is an addition, as applied to Saco River, be, and hereby are, extended and applied, and in any court of law shall be taken and construed to include, extend and be

applied to the rivers called the *Great Androscoggin* and *Kennebeck River*, below the bay called *Merry Meeting Bay*."

On March 4, 1808, another additional act was passed; and on February 2, 1816, still another one, referring to prize logs, timber, etc., in the Sheepscot River, Lincoln County, District of Maine. On February 16, 1816, was passed an act providing that logs left by floods on land adjoining the Saco should become the property of the owner of the land after one year. On February 9, 1818, an act extended the provisions applying to Saco River, to the Presumpscot River. It also provided that owners of logs, timber, etc., could enter any sawmill or boom in search of timber of theirs which they believed to be there, and they should not be prevented in their search. An act of February 19, 1818, extended the time of removing logs left by floods upon unimproved land adjoining the Saco to four years.

CUTTING PUBLIC TIMBER IN THE DISTRICT OF MAINE.

A resolve was passed June 14, 1817, authorizing the commissioners of the Land Office "to publish notifications, in such manner, and at such places, as they shall judge proper, forbidding all persons to cut and take from the Commonwealth's land, in the District of Maine, any timber, of any description whatever, without permission first had and obtained from said Commissioners: And said Commissioners are hereby authorized to appoint some suitable person, in all such places as they shall judge the public interest requires, to superintend and prevent the waste and destruction of said timber, and to collect the evidence of any trespass that may be committed on the public lands aforesaid."

The resolve further provided for seizure of timber illegally cut, for marking it and for penalties.

PENALTIES FOR DESTROYING TIMBER.

February 23, 1818, it was enacted that any one destroying a white pine tree or other tree twenty-four inches or upwards in diameter at twenty-four inches from the ground, or aiding in such destruction, should be punished by a fine not exceeding $500, or by imprisonment not exceeding one year. Any one destroying a tree of less diameter should be fined not exceeding $100, or imprisoned not exceeding six months. All such offenders should be liable in a sum equal to five times the value of the tree destroyed. All prosecutions must be begun within two years from time of offense.

SUBVENTIONS TO MILL BUILDERS.

The colonial governments, and those of the states during their early history, were paternalistic in a higher degree than those of a later era. The historian finds grants made not only in the interest of commerce but of manufacture. Grants of land and money to encourage the erection of sawmills and grist mills were frequent, as we have seen in previous chapters.

Mills of this character were so essential to the well-being of the community that, where conditions did not attract investment in them, the public lent its aid. Most of these subventions were made by the towns, but in one case Massachusetts made a grant to further development in the wilderness of western Maine. This was authorized by a clause in a resolve of February 17, 1818, as follows:

And be it further resolved, That there be, and hereby is granted the sum of five hundred dollars, to be paid out of the public treasury, to the Commissioners of the Land Office, to be laid out and expended under their direction, to erect a sawmill, forty-five feet in length, and eighteen in width, with a grist mill under, or adjoining the same, on Hale's Stream, (so called), as near as may be to Moose River; *provided*, persons of sufficient responsibility, in the opinion of said Commissioners, shall undertake to build the necessary dams, and complete said mills fit for use, within two years, receiving the benefit of this appropriation. And when the same shall be completed, said Commissioners are hereby authorized to convey to the party performing the same, fifty acres of land contiguous to said mills, and including in the deed thereof, one-half the stream and privilege necessary to said mills; and the use and improvement of said mills shall exclusively belong to the party building the same.

This appropriation having proved insufficient, the General Court, on February 20, 1819, passed the following:

Resolved, That the Commissioners of the Land Office be authorized to convey, to the persons who shall erect said mills, the whole of the stream and privilege, necessary to said mills, mentioned in said resolve, and one hundred acres of land, instead of fifty, as therein provided; said undertaking being in all other particulars in conformity to said resolve.

FELLING OF ADULT TIMBER UNDER COURT ORDER.

As the country developed, it became apparent that the restrictions on felling timber were too rigid and not in the interest of true economy; and so, on February 18, 1819, it was enacted "That any person, seized of a freehold estate, or of a remainder or reversion, in fee simple or fee tail, in a lot or tract of wood land in this Commonwealth, whereon the trees shall have come to an age and growth fit to be cut, may prefer a petition to the Supreme Judicial Court, . . . praying that the same may be felled and sold, and the proceeds thereof invested for the use of the persons interested in such wood lands." After an examination of the trees, and if same were likely to deteriorate in value, the Court could order trees to be cut and sold. The Court was to appoint Commissioners to superintend the felling and sale of trees.

REGARDING STANDARD MEASUREMENTS AND INSPECTION.

February 13, 1822, an act was passed providing that hewed spruce and pine timber, six inches square and upward, should be surveyed and sold on the basis of forty cubic feet to the ton, and that all sawed timber six inches square and upward should be surveyed in the same manner as boards and scantling. Any violator should be fined from $2 to $10.

February 26, 1825, an act was passed in addition to the act for the admeasurement of boards, shingles, hoops, etc., providing that shingles made or sold in the Commonwealth might be from fifteen to eighteen inches long, sawed or shaved, and bound in bundles of 1,000 or 500; and the quality of shingles should be designated by numbers 1, 2, 3, and refuse. Shingles branded 1 or 2 must be free of sap.

SUNDRY LAWS RELATING TO TIMBER AND LUMBER.

February 16, 1825, a resolve was passed to investigate into the depredations made by British subjects upon timber on lands in Maine belonging to that State and Massachusetts jointly.

June 16, 1825, an act was approved which prohibited the building of a fire in the woods of the town of Sandwich, Barnstable County, except between October 1 and March 1. Violation of this law was to be punished by a fine of $500 and by payment of damages, also. The act also prohibited the carrying of fire in woods of said town, except in covered vessel, under penalty of $25.

March 3, 1826, an addition to above act prohibited fires in huts of wood-cutters in the woods of the town of Sandwich between April 1 and October 1, under penalty provided by original act.

March 10, 1827, the Governor approved an act authorizing certain persons to use the tide waters between Chelsea and Deer Island, at a place called Point Shirley Gut, "for the purpose of improving and working a newly invented Floating Tide Mill."

March 6, 1830, an act was passed allowing the city of Boston to establish ordinances for the survey of lumber, and repealing certain sections of the act of July 12, 1783, and also the act in addition to it, passed March 16, 1784. This act was repealed in 1836.

March 12, 1830, an act was passed establishing a fine not exceeding $500, or imprisonment not exceeding one year, also liability to damage, upon any person drawing off water contained in a mill pond or dam, or destroying same, or injuring machinery of the mill.

AN INTERNATIONAL QUESTION.

Depredations on northern Maine lands led to the following report and resolution, adopted June 22, 1831:

The Committee on Public Lands . . . finds that this Commonwealth owns in severalty a number of townships, situate on and near the rivers and streams tributary to St. John's River, on which there is a considerable growth of valuable pine timber. It further appears that the people who reside in that section of the country are now actively engaged, without reason or pretence of right, in cutting down the timber, and removing it into the Province of New Brunswick, where, in consequence of a recent act of the Province, it is entered free of duty. Nothing can be more certain than that these depredations, already committed to a great extent, will be continued with increased vigor, unless measures are promptly taken for the purpose of discouraging

and preventing, directly or indirectly, such illegal proceedings. The Committee, after consultation with the Land Agent, are of the opinion that the least expensive and, upon the whole, the most effectual mode of guarding this valuable property . . . will be to grant permits to cut the timber to such persons as may apply for them. . . .

Resolved, That the Land Agent of this Commonwealth be, and he is hereby authorized, to sell such portions of the pine timber now standing upon the Public Lands, situate on and near the rivers and streams tributary to St. John's River, as is particularly exposed to depredations, upon such terms and conditions as in his opinion will best promote the interests of the Commonwealth.

FURTHER MISCELLANEOUS LAWS AND RESOLVES.

April 10, 1839, an act was passed providing that any person setting fire to a coal pit or a pile of wood in any of the woodlands in certain towns in Bristol and Plymouth counties, between April 1 and October 1, should be fined $100. Any one setting fire to brush wood on said woodlands should be fined $50.

March 18, 1840, an act was passed authorizing the city of Salem to establish ordinances and regulations respecting the survey of lumber.

February 10, 1841, an act was approved forbidding the erection of a mill dam to the injury of any other mill site on the same stream.

April 11, 1846, the resolve of June 22, 1831, was repealed, in the following terms:

Resolved, That the land agent be directed to suspend the granting of permits to cut down timber, on the lands situated on the river St. John and its tributary streams: *provided*, that if it shall be necessary for the prevention of trespasses, the land agent is authorized to grant a limited number of permits, not exceeding one for any one township. Approved by the Governor, April 11, 1846.

April 28, 1848, an act was passed giving power to the city of New Bedford to establish ordinances and regulations respecting the survey of lumber brought to that city for sale.

On April 21, 1852, the Governor approved an act establishing a State Board of Agriculture. The act was to take effect upon and after its passage.

May 15, 1857, an act was approved providing a punishment of not more than five years' imprisonment in the state prison, or a fine not exceeding $500 and imprisonment in the county jail not more than two years for any one obstructing the water of a mill dam.

THE SECOND SURVEYORS' ACT.

In 1858 the lumber industry secured a revision of the act of 1783, which had long been outworn, in the shape of a new act, approved March 27, which established and defined grades, and fixed the duties and compensation of surveyors. This important act was as follows:

Be it enacted, etc., as follows:

Section 1. There shall be elected at the annual meeting of each town, and appointed by each city in the Commonwealth, one or more well qualified and skillful surveyors

of lumber, who shall hold office for one year and until their successors be chosen and appointed, unless sooner removed: *Provided*, that the several cities may, from time to time, establish any ordinances, with suitable penalties, respecting appointment of surveyors for said cities, as they may deem expedient.

Section 2. The said surveyors shall survey oak and other hardwood commonly used in shipbuilding, mahogany, ash and other ornamental wood, and all other lumber, hereafter brought for sale into their Commonwealth, according to the provisions of this act; and shall also survey all lumber manufactured in this State, when requested so to do by either the purchaser or seller: *Provided*, that no surveyor shall survey any lumber in which he has a pecuniary interest.

Section 3. In the surveying of pine boards and planks, except southern pine there shall be six sorts. The first sort shall be denominated number one, and shall include boards not less than one inch thick, square edged, free from rot, shakes and nearly free from knots and sap, except such boards and planks as are not less than fifteen inches wide and not more than one-eighth waste, which shall be received as number one. The second sort shall be denominated number two and shall include boards not less than one inch thick, and of which not less than seven-eighths is suitable for planing and first class finish; *Provided*, that such boards as are clear but deficient in thickness as aforesaid, shall be received as number two. The third sort shall be denominated number three and shall include boards not less than seven-eighths of an inch thick and of which not less than three-fourths is suitable for planing and second class finish. The fourth sort shall be denominated number four and shall include boards not less than seven-eighths of an inch thick, nearly free from rot and nearly square edged, and suitable for covering buildings; all norway pine boards and planks shall be included in the fourth, fifth and sixth sorts. The fifth sort shall be denominated number five and shall include all boards and planks of every description not being within the other four denominations, except when one-third is worthless, which boards and plank shall be denominated refuse.

Section 4. In the survey of pine joist and dimension timber there shall be three sorts. The first sort shall be denominated No. 1, and shall include all joist and dimension timber that are sound and nearly square edged. The second sort shall be denominated No. 2 and shall include all other description except when one-third is worthless, which joists and dimension timber shall be denominated refuse.

Section 5. In survey of spruce, hemlock, juniper and southern pine boards, planks, sawed timber and joists, there shall be three sorts. The first sort shall be denominated No. 1, and shall include all boards, planks, sawed timber and joists that are sound and nearly square edged. The second sort shall be denominated No. 2 and shall include all other descriptions, except when one-third is worthless, which boards, planks, sawed timber and joists shall be denominated refuse.

Section 6. In survey of ash, maple and other hardwoods and ornamental boards, planks and joists, there shall be three sorts. The first sort shall be denominated No. 1 and shall include all boards, planks and joists that are free from rot, shakes and bad knots. The second sort shall be denominated No. 2, and shall include all other descriptions, except when one-third is worthless, which boards, planks and joists shall be denominated refuse.

Section 7. In survey of hewn timber, except mahogany and cedar, there shall be three sorts. The first sort shall be denominated No. 1 and shall include all timber that is sound and nearly square edged. The second sort shall be denominated No. 2 and shall include timber of all other descriptions, except when one-third is worthless, which timber shall be denominated refuse.

Section 8. In survey or oak, juniper and spruce knees, there shall be two sorts. The first sort shall be denominated No. 1 and shall include all sound knees of the following dimensions: Arm or root two feet long, body of knee four feet long, working thickness four inches; arm or root two feet and six inches long, body of knee four feet long, working thickness five and five and a half inches; arm or root three feet long, body of knee four feet and six inches long, working thickness six and six and one-half inches; arm or root three feet and six inches long, body of knee four feet and six inches long, working thickness seven and seven and a half inches; arm or root three feet and nine inches long, body of knee five feet long, working thickness eight and eight and a half inches; arm or root four feet long, body of knee five feet and six inches long, working thickness nine and nine and a half inches; arm or root four feet and six inches long, body of knee six feet long, working thickness ten and ten and a half inches. The second sort shall be denominated refuse and shall include all other descriptions of less dimensions than those specified in the first denomination; all knees shall have working thickness marked thereon, respectively, and on the first sort the number "one," shall be marked thereon.

Section 9. In the survey of mahogany and cedar there shall be but one sort and it shall be the duty of the surveyors, who are especially appointed to survey mahogany and cedar, to number all the mahogany and cedar logs or sticks contained in each lot or cargo in regular numerical order, and to mark the number of each log or stick upon the same, in legible characters. And the said surveyor shall, to the best of his ability, ascertain the whole number of feet, board measure, in each and every log or stick, and what quantity thereof is merchantable, and what is refuse. And said surveyor shall thereupon issue a certificate or survey bill of said survey, in which shall be stated the number of each log or stick, and the whole number of feet contained in the same, and specifying the number of feet which is merchantable and refuse respectively.

Section 10. All hewn timber, and all round timber, used for masts and shipbuilding, shall be surveyed and sold as ton timber, at the rate of forty cubic feet to the ton; oak and other timber and planks commonly used in shipbuilding, shall have the true contents marked thereon in cubic feet or board measure, and in the first and second sorts the numbers "one" and "two" shall be marked thereon respectively. In the survey of white and norway pine boards, planks, joists, sawed timber and dimensions, the contents of the same shall be truly marked thereon in legible numbers and on the 2nd, 3rd, 4th, and 5th sort of white and norway pine boards, planks and dimensions, the numbers shall be marked thereon respectively. All boards, planks, joists, sawed timber and dimension lumber shall be received and sold according to contents thereof as fixed and marked under the aforesaid regulations. In the admeasurement of rough timber, one-quarter of the girth shall be taken for the side of the square.

Section 11 provided for the fees for surveying and marking.

Section 12 provided for a fine of not less than $10 nor more than $50 to be imposed upon any surveyor guilty of fraud in surveying, or refusing to survey lumber when requested.

Section 13 provided a penalty of a sum equal to double the amount of fees for surveying, to be paid by any one buying or selling unsurveyed lumber.

Section 14 provided a penalty of not less than $50 nor more than $200 to be paid by any person acting as surveyor without authority.

Section 15 repealed all previous acts inconsistent with this act.

AFFORESTATION AND FOREST PRESERVATION.

April 9, 1878, an act provided that new plantations of timber trees, on lands whose actual value at time of planting did not exceed $15 an acre, of chestnut, hickory, white ash, white oak, sugar maple, European larch and white pine, in number not less than 2,000 trees to the acre, should be exempt from taxation for ten years after trees had grown four feet on the average, after planting.

March 17, 1880, an amendment to the act of April 9, 1878, included "all" pine trees instead of "white" pine.

"An act for the Protection of Forests against Fires," approved April 19, 1882, provided a penalty not exceeding $100, or imprisonment not exceeding six months for any person setting fire to any growing or standing wood. May 25, 1882, it was enacted as follows:

> The voters of any town . . . and the city council of any city, may, for the purpose of devoting a portion of the territory of each town or city to the preservation, reproduction and culture of forest trees for the sake of the wood and timber thereon, or for the preservation of the water supply . . . take or purchase any land within the limits of such town or city, may make appropriations of money, . . . may receive donations of money or land for the said purposes, and may make a public domain of the land so devoted. . . .
>
> Section 3. The State Board of Agriculture shall act as a board of forestry, without pay, except for necessary traveling expenses, and shall have the supervision and management of all such public domains, and shall make all necessary regulations for their care and use and for the increase and preservation of the timber, wood and undergrowth thereon, and for the planting and cultivating of trees thereon. . . .

By a resolve approved May 24, 1884, it was directed that the chief of the Bureau of Statistics of Labor should incorporate in the blanks for taking the next decennial census such inquiries as should determine as far as practicable the acreage of the woodland in the Commonwealth over thirty years' growth, the average age at which the forests of the Connecticut were then cut off, and make such other inquiries as might be practicable fully to determine the facts as to the cultivation, protection and depletion of the forests throughout the Connecticut Valley.

June 16, 1886, "An Act for the Better Protection of Forests from Fires" was approved, providing a penalty of not more than $250 for setting fire to woods. The act also provided for the appointment of forest firewards in all towns annually.

April 9, 1897, an act was approved providing that any town might accept the provisions of this act. The selectmen of such towns should annually appoint a forester to have charge of all trees in highways, public ways or squares of town, and to enforce laws relating to the setting out, cultivating and preserving of shade, ornamental or forest trees. The forester should be the chief forest fireward in such town.

In this place might be given the Massachusetts State law of 1904 in regard to the inspection of lumber; but as it applies particularly to Boston, and is commonly known as the "Boston survey," it is given in a succeeding chapter devoted to that market.

FOREST CULTURE IN MASSACHUSETTS.

The first attempt to promote forest culture in Massachusetts by legislation, in distinction from forest preservation, dates back to 1818, and was evidently intended to provide against a famine in ship timber. It is given in "Revised Laws," chapter 124, as follows: "Section 10. Every such society shall annually offer such premiums and encouragement for the raising and preservation of oaks and other forest trees as it considers proper and adapted to perpetuate within the Commonwealth an adequate supply of ship and other timber." The records show that in all $36,336.75 have been offered and $3,375.20 awarded. Of the funds offered, $12,000 was supplied by the Massachusetts Society for Promoting Agriculture; and of those awarded, $2,000 was paid by this society, making in all $1,375.20 awarded by the Commonwealth. No record of the acreage planted has been made, and the probability is that most of the contests were in ornamental rather than economic planting.

The next law intending to promote timber culture was passed in 1878. It provides for tax exemption of artificial plantations for a period of years. It is found in "Revised Laws," chapter 12, and is as follows:

Section 6. All plantations of chestnut, hickory, white ash, white oak, sugar maple, European larch and pine timber trees, in number not less than two thousand trees to the acre, upon land, not at the time of said planting woodland or sprout-land and not having been such within five years previously, the actual value of which at the time of planting does not exceed fifteen dollars per acre, shall, with such land, be exempt from taxation for a period of ten years after said trees have grown in height from four feet on the average subsequently to such planting, upon satisfactory proof by the owners to the assessors of these facts; but such exemption shall not extend beyond the time during which said land is devoted exclusively to the growth of said trees.

The law has been a failure, as practically no planting has been done under it.

The last law is found in chapter 409 of the Acts of 1904:

Section 3. The State forester may establish and maintain a nursery for the propagation of forest tree seedlings on such lands as the trustees of the Massachusetts Agricultural College may set aside for that purpose on the college grounds at Amherst. . . . He may distribute seeds and seedlings to landowners, citizens of the Commonwealth, under such conditions and restrictions as he may, subject to the approval of the Governor and Council, deem advisable.

The State forester has established the nursery under the authority given in the law cited above.

CHAPTER XVI.

MASSACHUSETTS—BOSTON.

The great center for lumber selling and distribution in Massachusetts always has been the city of Boston, and ever since its foundation that point has been one of the chief lumber distributing centers of the United States. The first entry in the Boston records concerning the subject of this work is dated September 1, 1634, and is in regard to the obstruction of landing places by logs and timber.

The first record, known to this writer, which uses the word "lumber," in the sense in which it is now used in the United States, was an instruction to the Boston police, dated April 27, 1663. It read in part as follows: "To cleare the ends of all streets and wharfes that butt upon the watter from all lumber and other goods." The word is supposed to have originated from the fact that logs and boards "lumbered up" the water front.

Of market conditions in Boston during colonial times, so far as lumber is concerned, there is little record. Its importance as a lumber market, however, has been coincident with its importance as a commercial center. As has been indicated in another chapter, the traffic in lumber was, early in the Nineteenth Century, of sufficient volume to necessitate legislation in relation to inspection.

With the exhaustion of the white pine in the vicinity of Boston, lumber operations extended into New Hampshire and Maine, and for many years those states were the chief source of supply for the immense lumber trade centering at Boston. The lumber merchants of that city were progressive and enterprising and shortly after 1850 commenced to draw on the Albany market as a source of supply for high grade white pine lumber. In schooners and sloops lumber was transported down the Hudson River from that point, through Long Island Sound and around Cape Cod to the docks of Boston. For many years Boston was one of the chief customers of the Albany lumber dealers, while always the Maine forests were drawn upon for pine and latterly for spruce. For the last quarter of a century spruce has entirely supplanted white pine as the standard house building material for Massachusetts. It is used for frames, sheathing and clapboards, and all general construction purposes.

Prior to 1867 the greater portion of the lumber used in that part of New England was manufactured in Maine and the British provinces and shipped by vessel to Boston, which port was the distributing center for

the cities and towns in the vicinity. Lumber was largely sold on the market or to arrive, and it was not an uncommon sight to see fifteen to twenty-five vessels anchored in the harbor, loaded with lumber to be sold. Special sizes and qualities were ordered direct from the mills. Finishing lumber was practically all of pine. It came in rough, and gave employment to a large number of planing mills. For a better class of work, mahogany, black walnut, cherry, chestnut, plain oak and butternut were used. Poplar, or whitewood, was unknown in house finish and was used in furniture only. North Carolina pine, rift sawed yellow pine and other quartered lumber were unheard of.

After 1867 the car trade in lumber received by rail increased enormously, partly from the fact that the trade demanded standard lengths, widths and qualities, and partly from the fact that the Maine forests were denuded of good pine and St. John, New Brunswick, was rapidly coming to the same point. By 1872 the eastern pine was practically out of the market and finishing lumber came only from the West.

Soon after the Civil War the demand for large and heavy timbers and framing material outstripped the possibilities of the Maine forests, and it was then that the Boston market reached out to the lower Atlantic Coast and Gulf section of the country for longleaf yellow pine. Since that period this wood has been the standard material for heavy construction timbers in that market and the trade has grown to be of large size.

Following 1897 or 1898 great changes occurred in the Maine and provincial trade, and the prices largely increased. Shipments by vessel declined. Very little lumber of late years has been sold on the market, as manufacturers recently have readily obtained advance orders at fair prices for the product of their mills. A dealer having an order for a house frame sends the schedule to the mill. It is sawed and delivered on the job in perhaps a week, direct from the cars, including boards and clapboards; and generally the lumber dealer never sees the lumber.

With the decreasing quantity of white pine lumber available for the Massachusetts market and its increased cost, the trade became interested in cypress and commenced the importation of that wood into Boston. A. T. Stearns was the pioneer importer of cypress in the East and the sentiment that he established for the wood there has developed and made Massachusetts one of the largest consumers of cypress of any state.

North Carolina pine, which now ranks as a considerable factor in consumptive demand in Boston and throughout all Massachusetts, is a comparatively new wood in the State. It has been handled in considerable quantities there only since modern dry-kilning processes were inaugurated at North Carolina pine mills, and, therefore, it has cut no considerable figure in the market save within the last ten years.

Boston, or rather its suburb of Chelsea, has become notable also within the last ten years or more as being the largest mahogany manufacturing point in the United States. The chief exponent of this industry has been George D. Emery, and his successor, the George D. Emery Company. This company owns its own ships, by means of which round logs are transported from Central and South America and the West Indies to Chelsea and there are converted into lumber and veneers. The company is also a heavy producer of Spanish cedar, which enters extensively into the production of cigar boxes.

In hardwoods Boston has been a leading commercial center for more than a century. Among the pioneer hardwood operators of Boston were H. Cutter & Co., Cutter, Clark & Co., Prime & Kenney, Noah Harrod & Co. and William R. Carnes. These firms' history dates back well toward the beginning of the Nineteenth Century.

In the early '40's such hardwoods as black walnut and cherry, ash and poplar were rare in the Boston markets. The first lot of black walnut marketed in Boston is said to have come from Albany about 1840 in a schooner under command of Captain Owen Bearse, who later engaged in the hardwood lumber business in Boston in partnership with his son. In 1844 another small lot of walnut arrived and was sold for stair rails and posts. It was a luxury in those days and indulged in only by the rich. In the summer of 1846 Robert Codwin, afterwards Surveyor General, received 1,300 feet of cherry, which was sold to be used for pulleys, stiles and thresholds. In the summer of 1847 a large lot of ash arrived consigned to a man named Benson, and was sold by him to Myers, Davenport & Bridges to be used for car work. In 1848 a lot of about 25,000 feet of poplar came in and was bought by the same firm. All these hardwoods were cut in Ohio. The lumber was generally eighteen or twenty feet long, with some of it as short as twelve feet. The quality was the very best, as the high cost of transportation made it inadvisable to ship anything that was ordinary.

In 1848 walnut began to be popular for furniture, and each succeeding year the trade increased. As Ohio was gradually depleted of its forests, the supplies came from Indiana. It was not until 1860 that all kinds of hardwoods were largely used for house finish and furniture.

The palmy days of the hardwood industry in Boston, however, were between 1860 and 1880. During that period Boston was celebrated for its extensive furniture factories, which produced great quantities of high class goods. This class of consumption has largely disappeared during the later years. The furniture factories have been driven out of business by the furniture makers of the middle West; but, even at this time, the hardwood business of eastern Massachusetts is an extensive one and

in any of a half dozen large hardwood yards in Boston can be found complete stocks of mahogany, red cedar, black walnut, white oak and red oak, whitewood, cherry, cypress, birch, beech, maple, ash, butternut, hickory, gum, boxwood, ebony, lignum-vitæ, rosewood, lancewood, dogwood, etc. In fact, in both building and hardwood lumber Boston is, perhaps, the most diversified market in the United States. It would be difficult to name any native or foreign wood that cannot be obtained there and is not regularly held in stock. For years Boston was an extensive buyer of black walnut; but, with the approximate exhaustion of this wood, oak is now the chief item of fine domestic wood handled.

It will be seen that Massachusetts today has become an importer of nearly all its lumber supplies. The chief center of the wholesale lumber trade in the State still remains at Boston. The coterie of merchants making up the wholesale lumber fraternity of Boston numbers upwards of one hundred and fifty firms.

Boston has had a number of lumber firms whose business existence has extended over many years. The firm of Edward D. Peters & Co. was founded in 1811; and, on the death of Mr. Peters, the business descended to his son, George H. Peters, and the firm became George H. Peters & Co. That continued the firm name until 1887, when, upon the retirement of George H. Peters, the firm became composed of George H. Davenport, G. Gorham Peters, son of the senior member, and William Bacon, under the name of Davenport, Peters & Co. The firm is still in existence.

In 1843, at the age of sixteen, Otis Shepard was given a small interest in the firm of A. & W. Pope, lumber dealers, on Commercial Street, Dorchester. In 1865 he bought the Pope interest and continued the business under the same name. He later added another yard on Sweet Street, Roxbury. In 1865 he established a wholesale house on Central Street, Boston, under the style of Shepard, Hall & Co. In 1878 he organized the Shepard & Morse Lumber Company, of which he continued president until his death May 22, 1900. He bore a prominent part in the Burlington (Vermont) lumber market, as was mentioned in a preceding chapter.

The A. T. Stearns Lumber Company, of Boston, was founded by A. T. Stearns, who died in April, 1905. He was born at Billerica, in 1821, and at an early age showed an aptitude for the woodworking business. His first mill stood on what was later the site of the Butterick Lumber Company's extensive plant at Waltham. Several years later he laid the foundation of extensive operations at Neponset, where was erected the plant of the A. T. Stearns Lumber Company, the largest and most complete of its kind in New England. In the invention and introduction of special machinery adapted to the growing and specialized needs of his business, Mr. Stearns showed an ingenuity of the highest order.

An old time lumberman of Boston was Joseph G. Gooch, who from 1855 until 1883 was engaged in the lumber business in that vicinity. He was at one time president of the Lumber Dealers' Association of Boston. He died September 20, 1905.

For forty years Theodore H. Buck was engaged in the lumber business at Chelsea. In partnership with his brother, George H. Buck, he established the firm of T. H. Buck & Co. at Chelsea immediately after his return from the war. He died in July, 1905.

Many of the retail yards of Boston were in business for a long period of time. The J. O. Wetherbee Company had its beginning in the business of Loyal Lovejoy, who founded a yard at the corner of Causeway and Beverly streets in 1837. An immense sign made from a huge plank from California and bearing the inscription, "L. Lovejoy & Co., Lumber, J. O. Wetherbee," for a long time marked this yard. Loyal Lovejoy died in February, 1877, and was succeeded by J. Otis Wetherbee.

Joseph Goodnow's wharf, still in existence and conducted by his heirs, was established in 1840.

Henry N. Clark formed a partnership with Aaron Guild in 1843. Mr. Guild died in the early '80's, but the business was continued by his partner.

Granville Fuller opened a yard in the Brighton district about 1845, and the business is still in existence.

Captain Owen Bearse, who, as mentioned earlier in this chapter, brought the first lot of black walnut lumber into Boston by way of Albany, about 1840, for a number of years ran a hardwood lumber yard on Federal Street in partnership with his son, Horace Bearse.

In Boston in 1882 the total number of lumbermen, both wholesale and retail, was 102, divided as follows:

Wholesale hardwood	7	Wholesale eastern pine and spruce	7
Wholesale hardwood and pine	35	Wholesale brokers	2
Wholesale yellow pine	2	Retail yards	49

In November, 1872, Boston was devastated by one of the largest fires on record. Within forty-eight hours the flames devoured property valued at $80,000,000. With admirable courage the stricken citizens rallied and the city was practically rebuilt within the ensuing twelve months.

Boston always has been a large distributing center for lumber, but during the twenty years prior to 1904, it had increased its business, and now its firms have branches in the large lumber districts and fill orders for all points in the United States and foreign countries. They employ a large amount of capital and are bright, active, energetic and capable merchants.

SPRUCE AND HEMLOCK VALUES.

It may be of interest to quote here the prices of spruce and hemlock

which obtained for a succession of years for random cargoes delivered at Boston. The prices were taken from merchants' books, and apply to random cargoes, sold on the market. Special orders, of specified sizes, were sold at higher prices, depending on the sizes, while some Nova Scotia cargoes of undesirable sizes were sold at lower than quoted prices. These cargoes were largely of the sizes that would not make English deal, viz., 3x7, 3x9 and 3x11. Spruce in 1860 and 1861 was low of price and orders were taken and filled at $6.50 a thousand f. o. b. Bangor.

PRICES OF RANDOM SPRUCE AND HEMLOCK CARGOES DELIVERED AT BOSTON.

Year.	Spruce.	Hemlock.
1860 and 1862	$ 9.00 to $11.50	$ 7.00 to $ 8.50
1863	13.50	9.00
1864	15.00	14.00 to 15.50
1865 and 1866	20.00 to 21.00	15.50
1867	18.00 to 19.00	14.50
1868	15.00 to 17.00	14.50
1869	12.00 to 16.00	14.00
1870	16.50 to 17.50	15.00
1871	14.00	14.00
1872 (great fire)	18.00 to 20.00	15.00 to 16.00
1873	14.00	14.00
1874	13.00	12.00
1875	11.00	10.50
1876, '77, '78, '79	10.00 to 11.00	9.00
1880	13.00 to 17.00	12.00 to 13.00
1881	14.00	12.00
1882, '83, '84	12.50 to 13.50	12.00 to 12.50
1887 and 1888	13.00 to 14.00	12.00
1890	13.00	12.00
1891, '92, '93	12.00 to 14.00	10.00 and 12.00
1896	12.00 to 13.00	9.50 to 10.00
1897, '98 and '99	14.00 to 17.00	13.50
1900	16.00 and 17.00	14.00 and 15.00
1902	14.50 to 17.00	14.00 and 15.00
1903 and 1904	16.00 to 18.00	14.00

In November, 1904, prices for spruce, via cars, on orders, were:

10 and 12 inch dimension	$21.00
9 inch and under	19.00
2x3, 2x4, 3x4, 2x5, 2x6, 2x7 random	17.50
Other randoms under 9 inches	18.50
Above 28 feet, per thousand feet extra	.50

Difficult orders brought increased prices. Hemlock of the above named sizes sold at about $2 less. Hemlock boards planed, on cars, were $14.50 and $15.50, the latter for stock lengths.

The period from 1868 to 1878 witnessed marked changes in both the price and quality of lumber on the Boston market, in keeping with similar changes that were occurring in every lumber market in the country. Some figures are here given bearing testimony to these fluctuations, the prices quoted being those paid for lumber purchased in wholesale lots in the Boston market in the years named. In February, 1868, prices prevailing in the Boston market were the following:

Spruce Lumber—Assorted cargoes, plank, timber, etc., $15 to $17; dimension lots (sawed to order), $18 to $25. Lath, $2.50 to $3. Shingles, extra, $2.75; No. 1, $2.25 to $2.50. Clapboards, extra, 4 feet, $28 to $30; Vermont dressed, 6 feet lengths, extra 6-inch, $48 to $54; clear 6-inch, $45 to $50; No. 1, 6-inch, $40 to $46; extra 5½-inch, $43 to $50;

clear 5½-inch, $40 to $46; No. 1, 5½-inch, $35 to $42. Pickets, 6 feet 3 inches, extra, $28, No. 1, $20; 5 feet 3 inches, extra, $22, No. 1, $18; 4 feet 3 inches, extra, $16; No. 1, $12.

Pine and Hemlock Lumber—St. John and eastern No. 1, $75 to $80; No. 2, $65 to $70; No. 3, $55 to $60; No. 4, $35 to $45; No. 5, $25 to $30; coarse, No. 5, $18 to $20; shipping boards, $21 to $23. Michigan pine, No. 1, $70; No. 2, $60; No. 3, $50; No. 4, $40. Canadian pine, selects, $55; clear strips, $40 to $42; common strips, $25 to $28; shipping boards, $26 to $27. Pine lath, $2.75 to $3.25. Pine clapboards, extra, 4 feet, $50 to $55; clear, $45 to $50; sap, $35 to $45. Pine shingles, shaved, $5 to $8; sawed, $3 to $7. Cedar shingles, shaved, $4 to $7; sawed, $3 to $5.25. Hemlock boards, $13.50 to $15. Sugar box shooks, 65 to 70 cents.

Hardwood—Western oak, $45 to $55; cherry, $58 to $60; ash, $50; maple, $30 to $45; birch, $25 to $35; whitewood, $45 to $50; northern chestnut, $25 to $35; black walnut, $65; butternut, $55 to $60.

Southern Pine—Resawed, assorted, $30 to $35; dimension (cut to order), $32 to $40; ship stock, $33 to $37; West Indian cargoes (at mills), $18 to $22; South American cargoes (at mills), $21 to $24; flooring boards, $30 to $35; hewn timber, $20 to $30.

For purposes of comparison, there are appended to the above statement quotations covering the principal items of lumber during the period of the middle '70's, the figures in each case being for January of the year named, unless otherwise noted:

1874.

Western Lumber—Michigan pine, Nos. 1 and 2, $60; No. 3, $50; No. 4, $37 to $38. Black walnut, Nos. 1 and 2, $75 to $82.50; ditto refuse, two-thirds price. Ash, Nos. 1 and 2, $40 to $48; 3d quality ditto, $30 to $40. Whitewood, Nos. 1 and 2, inch, $42 to $48; ditto ⅝-inch, $33 to $35; 3d quality, $25 to $30. Oak, $45 to $50. Butternut, Nos. 1 and 2, $55 to $65; 3rd quality, $30 to $35. Michigan pine saps, $40 to $45; ditto pickings, $40 to $44. Michigan shippers, $25 to $28. Best Michigan 6-inch strips, $55 to $58.

Canadian Pine—Selects dressed, $60; shelving ditto, $50 to $52; second shelving, $40 to $42; sheathing, first quality, $50 to $52; sheathing, 2d quality, $36 to $38; ceiling dressed, $38 to $40; dressed shippers, $30 to $32.

Eastern—Pine, clear, Nos. 1 and 2, $65; No. 2, $50; No. 4, $40; No. 5, $30 to $32; common pine shipping boards, $20 to $22; No. 5, $20 to $22; refuse, $10 to $14. Spruce, scantling and plank, $16 to $17; boards, $16 to $17; hemlock boards, $11 to $13. Lath, spruce, $1.75 to $2.00; hemlock, $1.50; pine, $2.00 to $2.25.

Southern Pine—Flooring Nos. 1 and 2, $32 to $35; ship stock, $34 to $37; dimension, factory, $30 to $40, according to size; hewn timber, $30 to $33; random cargoes, $4 to $5 less; refuse, two-thirds price.

Shingles—Spruce, extra, $2.00 to $2.25; No. 1, $1.75 to $2; shaved pine, $8; sawed, $2.50 to $5; shaved cedar, $3 to $6.25; sawed extra, $4.50; clears, $3.50 to $4; No. 1, $2.50 to $3; No. 2, $1.50 to $1.75.

Clapboards—Spruce, extra, dressed, 4 feet, $34 to $35; clear, $24 to $30; No. 1, $15 to $20; dressed, extra, 6 feet 6 inches, $45 to $50; clear, $37 to $40; No. 1, $30 to $35; pine, extra, sap dressed, $50 to $55; clear, $48 to $50; No. 2, $25 to $30.

1875.

Michigan Lumber—Nos. 1 and 2, $56; No. 3, $44; pine saps, $36 to $38; ditto pickings, $34 to $36; shipper, $25 to $30; best strips, $50. Black Walnut, Nos. 1 and 2, $65 to $75; culls, $35. Ash, Nos. 1 and 2, $40 to $45; culls, $20. Cherry, Nos. 1 and 2, $60 to $65; culls, $30. Whitewood, Nos. 1 and 2, $35 to $40; ditto, ⅝, $26 to $30. Oak, $50. Butternut, Nos. 1 and 2, $50 to $60; culls, $15 to $20.

Eastern—Pine, clear, Nos. 1 and 2, $50; No. 3, $45; No. 4, $35; No. 5, $25 to $30;

pine shipping boards, $18 to $20; No. 5, $18 to $19; refuse, $11 to $13; rots, $7 to $9. Random cargoes spruce, scantling and plank, $13 to $13.50; ordered cargoes, $14 to $15; boards, $13 to $14. Hemlock boards, $10; ditto planed, $11.50. Lath, spruce, $1.60 to $1.75; hemlock, $1.25; pine, $1.75 to $2.

Southern Pine—Pine Flooring and step plank, $28 to $30; dimension timber, $24 to $26; ship stock, $26 to $28.

Shingles—Spruce, extra, $2; No. 1, $1.50 to $1.75. Pine, shaved, nominally $6 to $8; sawed extras, $4 to $5; clears, $3.50 to $4; No. 1, $2.50 to $3; No. 2, $1.50. Cedar, shaved, $3 to $5.50; sawed extra, $4.25 to $4.50; clears, $3.50 to $4; No. 1. $2.50 to $3; No. 2, $1.50.

Clapboards—Pine, extra sap, dressed, $45 to $50; clear, $40 to $45; No. 1, $20 to $25.

1876 (July).

Eastern Lumber—Pine, Nos. 1 and 2, clear, $50; No. 3, $40; shipping, $18; ditto No. 5, $25; refuse, $10. Spruce cargoes, $13. Hemlock, $10. Spruce lath, $1.25. Pine lath, $1.50. Spruce shingles, extra sawed, $4; ditto clear, $3; ditto No. 1, $2.25; spruce clapboards, extra, 4 feet, $32; ditto, clear, $25.

Michigan Pine—Nos. 1 and 2, clear, 1-inch, $48 to $50; No. 3, 1 to 3 inch, $38 to $42; saps, $36 to $38; pickings, $30 to $32; common, $22 to $24; C common, $14 to $16; pine shingles, extra sawed, $3.50 to $4; ditto, clear, $3.50 up; ditto No. 1, $2.50 up; pine clapboards, extra, $35 to $40; ditto, clear, $30 to $35; ditto, No. 1, $22 up.

Michigan Hardwood—Black walnut, $80 to $85; white ash, No. 1, $46 up; ditto No. 2, $20 up; brown ash, $30 up; butternut, $60 up; rock maple, $40 up; whitewood, 1-inch, $42 to $43, $\frac{5}{8}$-inch, $30 to $33; cherry, $\frac{5}{8}$-inch, $53 to $55; chestnut, No. 1, $40 to $42; basswood, $22 to $24.

1877.

Eastern—Pine, Nos. 1 and 2, clear, $48 to $50; No. 3, $40; No. 5, $23; shipping, $18; refuse, $10; random cargoes, $9 to $11. Hemlock, $9 to $9.50; spruce lath, $1.25; pine lath, $1.50.

Michigan Pine—Nos. 1 and 2, 1-inch, clear, $45 to $48; uppers, $43 to $46; selects, $30 to $35; fine common, $25 to $27; C common, $14 to $16.

Shingles—Extra spruce, $1.75; pine, shaved, $5; ditto, extra sawed, $3.25 to $3.50; ditto, clear, $2.75 to $3; ditto No. 1, $2 to $2.25; cedar, shaved, $3 to $4.75; ditto, extra sawed, $4.25; ditto, clear, $3.50.

1878.

Spruce—$12 to $12.50 for ordinary yard sizes, sawed to order; wide sizes, $13.50 to $15.50; side boards, $10 to $12; upper floors, clear and second, planed and jointed, $15 to $18; refuse or coarse boards, $7 to $9; planed, $8.50 all. Random plank, scantling and timber, $11.50 to $12, according to width and lengths.

Eastern Pine—Clear, Nos. 1, 2 and 3, $35 to $43; No. 4, $30 to $33; No. 5, $22 to $25; shippers and coarse No. 5, $15 to $17; refuse $10 to $12; rots, $6 to $8. These prices are at Boston survey. Rough edge pine box boards, $\frac{7}{8}$ and 1 inch, $10 to $12, according to width, quality and dryness; $\frac{3}{4}$-inch, $9 to $10.

Western Pine—Uppers, $38 to $42, according to width and softness; selects, $28 to $32; fine common, $25 to $27; coarse common, $18 to $19; matched culls, $17 to $18; wide coffin boards, $19 to $21; sheathing, 6-inch strips, clear both sides, $35 to $38; clear one side, $29 to $31; No. 2, $25 to $27; No. 3, $19 to $21.

Hardwoods—Black walnut, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch, dry and good quality, $72 to $75; $\frac{5}{8}$-inch, $60 to $68; selected walnut and counter tops, $85 to $100; balusters, $45 to $50. Ash, $35 to $37. Whitewood, $\frac{5}{8}$-inch, $25 to $27; 1-inch, $35 to $37. Cherry, $50 to $55. Oak, $30 to $35.

Hemlock—Rough, $8.50 to $9.50; stocks and planed, $9 to $10.50.

Clapboards—Four-foot heart, pine, $30, $40 and $45; saps, $25, $35 and $40. Slash pine are not wanted. Six and 5½ inch 6 foot spruce, extra and clear, $30 to $40 and $25 to $30 per M. pieces; 4-foot extra, $20 to $23; clear, $18 to $20; No. 1, $10 to $15.

Shingles—Shaved cedars, No. 1,$4.25 to $4.50; No. 2, $4; No. 3, $2.75 to $3; Nos. 4 and 5, $2 to $2.50; sawed cedars, extra, $3 to $3.25; extra No. 1 and clear, $2.50 to $2.75; No. 1, $2 to $2.25; cheap No. 1, $1 to $1.25. Western sawed pine, 16-inch, $3.25; 18-inch, $4.25. Spruce $1.37½ to $1.50. Sap pine, $1.25.

Cedar Posts—Eight feet, good size and straight, 18 to 20 cents; 10 feet, 25 to 30 cents; 12 feet, 30 to 40 cents.

Spruce Piling—Good size and lengths, 3 to 4 cents.

Railway Sleepers—Hemlock and cedar, 24 to 35 cents. Norfolk ties, 40 to 43 cents.

Lath—$1.50 to $1.62½; round wood lath, 12½ to 25 cents.

Hemlock Bark—$8 to $9.

Wood—Hard, $6; soft, $5.50; slabs, dry, single sawed, good size, $4.75 to $5; green, $4.25 to $4.50; board slabs, $4.25 to $4.75. Birch edgings, $5.50. Dry hemlock slabs, $5.

Southern Pine—Prime flooring and step plank, $28 to $28.50; building and bridge orders, $23 to $25; ship orders, $23 to $27. South American and West India orders, dry or green, $14 to $18 at mills. Second quality flooring, $12 to $18; flooring running long or large into seconds, $25 to $27. Usual yard orders, $22 to $23.

1879 (July).

Michigan Pine, Boards and Plank, 1 to 2 Inch—Uppers, $35 to $38; selects, $26 to $30; fine common, $22 to $24; 1st sheathing, 4 to 6-inches, clear, $33 to $35; 2d sheathing, 4 to 6 inch, select and fine common, $24 to $26; 1st shelving, select, $32 to $35; 2d ditto, fine common, $25 to $27; 1st base clear, $30 to $33; 2d ditto, select and fine common, $22 to $25; barn boards, 12-inch, $20 to $21; wide common boards, 13-inch and upwards, $19 to $20; 8 to 12 inch, common boards, $15.50 to $17; 12-inch common stocks, $17 to $19.

Eastern Lumber—Pine, Nos. 1 and 2 clear, $40 to $45; No. 3, $24 to $26; No. 4, $20 to $23; No. 5, $19.50 to $22; shipping, $15 to $16; refuse, $10 to $11. Lath, spruce, $1.25 to $1.50; lath, pine, $1.25 to $1.50. Random cargoes, spruce, $9.50 to $10.50. Hemlock boards, $9 to $10.

Shingles—Extra, spruce, $1.50; pine, shaved, $5; ditto, extra sawed, $3.25 to $3.50; ditto, clear, $2.75 to $3; ditto, No. 1, $2 to $2.25; cedar, shaved, $3 to $4.75; ditto, extra sawed, $3 to $3.25; ditto, clear, $2.50 to $2.75; ditto, No. 1, $2 to $2.20; ditto, No. 2, $1.10 to $1.25; spruce, $1.25 to $1.50.

Clapboards—Extra, spruce, dressed, 4 feet, $18 to $20; spruce, No. 1, 4 feet, $12 to $14; ditto, extra, 6 feet, $35 to $40; ditto, clear, 6 feet, $30 to $35; ditto, clear, 4 feet, $17 to $18; pine sap, extras, $33 to $35; ditto, sap clears, $30 to $33; ditto, sap, 2d clears, $22 to $25.

Hardwoods, Boards and Plank, 1 and 2 Inch—Black walnut, Nos. 1 and 2, dry, $65 to $70; ditto, ⅝-inch, dry, $55 to $70; ditto, thicker sizes, $70 to $75. Ash, 1 and 2, Michigan, white, $30 to $33; ash, 1 and 2, Michigan, black, $20 to $25; ash, 1 and 2, Indiana, $30 to $33. Whitewood, 1 and 2, ⅝-inch, $24 to $25; ditto, 1-inch, 14 to 16 feet boards, $29 to $32; ditto, 1-inch ordinary widths, $27 to $29; ditto, 1¼ to 2 inches, $29 to $32. Cherry, Nos. 1 and 2, 1 to 2 inches, $50 to $55. Maple, ditto, $30 to $40. Hickory, ditto, $35 to $65. Oak, ditto, $33 to $35. Basswood, $22 to $25. White oak, $45 to $60. Mahogany, Mexican, 14 to 20 cents a foot; mahogany, San Domingo, 20 to 30 cents a foot.

THE SHIPPING PROMINENCE OF BOSTON.

By the end of the Seventeenth Century Boston was considered the greatest seaport of all the colonies, and in many respects was the most important town in North America. An Englishman, named Daniel Neal, wrote in 1719 that "The bay of Boston is spacious enough to contain in a manner the navy of England. The masts of ships here, at proper seasons of the year, make a kind of wood of trees, like that we see upon the river Thames about Wapping and Limehouse, which may easily be imagined when we consider that by computation given into the collectors of his Majesty's customs to the governor upon the building of a lighthouse, it appeared that there was 24,000 ton of shipping cleared annually. At the bottom of the bay is a noble pier 1,800 or 2,000 feet long, with a row of warehouses on the north side for the use of merchants. The pier runs so far into the bay that ships of the greatest burthen may unload without the help of boats or lighters."[1]

As Boston was such an important factor in the early shipping trade, it is to be regretted that there are no figures obtainable showing the volume of business done in lumber and its affiliated industries at that time. The earliest figures accessible are taken from the census returns of 1837. According to those figures Boston at that time had twenty-three chair and cabinet factories with an annual production of chairs and cabinet ware valued at $148,100. The vessels built for the five years preceding April 1, 1837, numbered thirty-seven. Their tonnage was 8,612 and the value $622,000.[2]

In the chapter captioned "Statistics" will be found tables showing the exports and imports of forest products—unmanufactured and manufactured—from and to the port of Boston from 1856 to 1905, inclusive.

OFFICIAL SURVEY FOR FORTY-FOUR YEARS.

Hereto is appended a table showing the aggregate of lumber surveyed in the first Massachusetts district for the period from 1860 to 1905, inclusive, compiled for this history from the returns of the Surveyor General of lumber deposited in the office of the Secretary of the Commonwealth of Massachusetts.

The first Massachusetts district includes the city of Boston and the surrounding towns. Practically all the lumber which arrives in that State by water comes into Boston, and a good deal of it is reshipped to interior points. According to the Massachusetts law all foreign lumber must be surveyed by a Surveyor General, who is a State official, but lumber coming from domestic points need not be surveyed unless the consignees desire, and as a rule carload lumber is surveyed by the retail yard in-

[1] The Encyclopedia Americana.
[2] "Historical Collections of Massachusetts," Barber, 1848.

spectors, as it is cheaper. The retail inspectors survey part of the cargo spruce, but the Surveyor General surveys a good deal of it and most of the hard pine and cypress. He is appointed by the Governor, subject to confirmation by the council, and usually upon the recommendation of the lumber associations of Boston, who also have a general supervision of his work as a matter of fact, although this is not provided by law.

The decrease of inspection to be noted in this table is due to various causes. Less lumber is being shipped by vessel and more by car, and retail yards are doing much of their own work and the figures do not go through the Surveyor General's office. The English market is taking much more lumber than formerly from Nova Scotia and New Brunswick, so less lumber is coming from these foreign points to be surveyed. The River Platte, Central America and Cuba have not been taking lumber to as large an extent as formerly, and the large export trade from Boston has almost died away, owing to the decrease in the receipts of lumber which used to be brought in by vessel to be shipped out by tramp steamer. Steel frame buildings also cause less structural timber, sheathing, etc., to be used in Boston.

Southern hard pine and cypress have entered into the Boston market in steadily increasing quantity. Cypress, one of the conspicuous rivals of northern pine, was first reported in 1890 when the survey was 1,343,572 feet for nearly nine months of that year, but considerable quantities were used before that date. From that time there was a fluctuating increase until a mark of 9,128,579 feet of cypress inspected was reached in 1902.

History may be traced in the survey of southern pine at Boston. For the ten months from December 1, 1859, to October 1, 1860, the inspection of southern pine was 8,773,301 feet. During the year beginning September, 1861, the survey of southern pine dropped to 956,473 feet and between September 30, 1862, and September 30, 1863, when the Civil War was in progress, it quite naturally dropped to the minimum figure of 47,904 feet for an entire year. From September 30, 1865, to September 30, 1866, one may see evidences of reconstruction and the resumption of trade relations between the North and the South. From September 30, 1864, to September 30, 1865, the quantity of southern pine handled by the official inspectors at Boston had been only 290,551 feet, but in a single year it jumped to 6,042,789 feet, the survey between September 30, 1865, and September 30, 1866, being 6,333,340 feet. This figure was more than doubled the following year and, in according a market for southern pine, Boston thus assisted in the rehabilitation of the South. The early high water mark was reached in 1873 and it has never since been equaled, although the present receipts of southern pine are large, aggregating in 1902 a total of 20,690,754 feet. Figures relating to other

woods contained in this table will be found of like interest. It should not be forgotten that the following table represents only the quantities that have passed through the hands of the Suveyor General and his deputies, ignoring the large quantities which by special agreement have been privately inspected. The volume of the latter is, unfortunately, not known.

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH.

VARIETIES.	From Dec. 1, 1859 to Oct. 1, 1860	From Oct. 1, 1860 to Nov. 22, 1860	From Nov. 23, 1860 to Sept. 30, 1861	From Sept. 30, 1861 to Sept. 30, 1862	From Sept. 30, 1862 to Sept. 30, 1863	From Sept. 30, 1863 to Sept. 30, 1864	From Sept. 30, 1864 to Sept. 30, 1865	From Sept. 30, 1865 to Sept. 30, 1866	From Sept. 30, 1866 to Sept. 30, 1867
White Pine	41,673,804	17,521,870	25,476,636	38,268,413	44,993,106	46,350,275	44,745,401	41,087,197	51,767,134
Spruce	36,624,120	12,792,833	20,618,875	32,571,010	42,356,670	42,764,869	38,954,837	54,488,908	54,478,706
Hemlock	6,839,156	1,238,331	4,376,353	4,875,994	5,776,944	7,292,633	4,105,777	6,698,225	6,786,448
Whitewood	139,278	63,472	46,823	267,611	36,866	520,810	267,696	541,613	734,692
Southern pine boards, planks and flooring	8,773,301	1,114,741	8,159,401	956,473	47,904	126,699	290,551	6,333,340	12,839,121
Hardwood, oak, ash, walnut, cherry	5,133,209	1,559,426	2,596,810	5,091,745	8,666,262	10,916,475	7,735,840	9,754,711	13,785,721
Ship knees	137	.....	517	4,179	4,161	2,780	1,143	2,100	2,551
Cedar	212,046	6,344	150,365	155,468	415,222	377,385	322,821	135,468	252,678
Mahogany	596,396	44,314	117,275	.....	45,417	54,855	276,467	586,601	200,280
Pine joist, etc	1,743,588	784,155	1,806,544	2,113,948	2,964,445	3,407,134	1,923,802	2,841,190	2,114,427
Bay mahogany	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cypress	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black walnut	.....	.....	.....	.....	.....	.....	.....	.....	.....
Satinwood	.....	.....	.....	.....	.....	13,299	14,634	.....	.....
Baywood	.....	.....	.....	.....	.....	.....	.....	5,308	46
Hard pine boards, planks and timber	10,680	153,200	384,528	437,101	.....	.....	.....	.....	.....
Mahogany and cedar	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sycamore	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cherry	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	172,288	41,783	275,713	551,152	434,019	389,290	286,463	116,916	127,065
Hewn pine and pine ton timber, cubic ft	79,786	36,737	22,201	57,217	49,763	104,026	46,138	30,504	33,856

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH.—Continued.

VARIETIES.	From Sept. 30, 1867 to Sept. 30, 1868	From Sept. 30, 1868 to Sept. 30, 1869	From Sept. 30, 1869 to Sept. 30, 1870	From Sept. 30, 1870 to Sept. 30, 1871	From Sept. 30, 1871 to Sept. 30, 1872	From Sept. 30, 1872 to Sept. 30, 1873	From Sept. 30, 1873 to Sept. 30, 1874	From Sept. 30, 1874 to Sept. 30, 1875	From Sept. 30, 1875 to Sept. 30, 1876
White Pine	56,511,368	55,848,000	46,514,081	43,613,518	38,825,536	31,390,363	25,235,286	15,723,011	14,433,418
Spruce	65,026,924	74,334,524	76,913,537	97,075,304	87,908,344	79,370,500	64,305,187	44,273,117	33,825,714
Hemlock	9,973,053	10,877,885	11,612,673	16,175,501	14,102,096	15,597,478	15,220,862	8,191,428	6,677,523
Whitewood	369,216	416,869	1,314,112	2,512,680	2,154,871	2,139,924	2,059,026	1,704,529	1,417,060
Southern pine boards, planks and flooring	16,357,535	19,794,796	15,182,080	14,915,148	23,919,487	44,743,379	28,549,869	14,538,810	10,685,053
Hardwood, oak, ash, walnut, cherry	10,452,071	13,859,961	14,646,730	17,494,432	14,949,481	15,744,145	16,591,598	11,937,747	7,596,321
Ship knees	4,943	5,962	1,445	2,285	2,263	2,719	8,517	2,232	2,154
Cedar	252,093	274,396	185,717	359,890	369,137	372,714	631,210	207,643	29,984
Mahogany	30,612	43,723	36,803	144,724	46,756	19,600	5,558	84,784	.....
Pine joist, etc	2,528,531	1,943,972	765,041	1,695,460	1,492,203	1,603,906	1,213,742	471,533	466,171
Bay mahogany	.....	.....	119,482	201,450	204,768	194,780	262,178	203,566	.....
Cypress	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black walnut	.....	7,446	5,046	4,420	5,407	.....	2,438	.....	.....
Satinwood	1,999	3,184	.....	.....	.....	523	.....	23,459	.....
Baywood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hard pine boards, planks and timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahogany and cedar	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sycamore	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cherry	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	178,252	200,981	102,429	48,186	42,611	87,348	182,876	67,254	26,636
Hewn pine and pine ton timber, cubic ft	16,214	14,987	25,044	28,797	27,046	11,733	37,862	9,533	1,989

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH.—Continued.

Varieties.	From Sept. 30, 1876 to Sept. 30, 1877	From Sept. 30, 1877 to Sept. 30, 1878	From Sept. 30, 1878 to Sept. 30, 1879	From Sept. 30, 1879 to Sept. 30, 1880	From Sept. 30, 1880 to Sept. 30, 1881	From Sept. 30, 1881 to Sept. 30, 1882	From Sept. 30, 1882 to Sept. 30, 1883	From Sept. 30, 1883 to Mar. 14, 1884	From Mar. 14, 1884 to Oct. 1, 1884
White Pine	14,667,430	12,493,538	13,169,137	17,684,747	16,382,424	18,387,478	13,595,300	4,258,324	7,581,257
Spruce	31,223,955	27,831,988	27,309,829	35,812,019	38,181,158	43,817,774	39,738,274	13,881,568	25,778,950
Hemlock	6,676,424	6,253,864	5,795,190	4,787,157	7,389,215	6,344,170	5,514,621	1,516,062	4,011,413
Whitewood	2,298,020	1,803,950	1,329,745	3,312,385	5,048,838	5,035,850	7,512,141	2,987,014	6,986,195
Southern pine boards, planks and flooring	15,440,543	15,707,025	11,955,820	21,090,031	28,127,166	23,228,639	17,905,136	7,611,647	8,137,900
Hardwood, oak, ash, walnut, cherry	10,321,776	9,056,832	10,326,155	13,338,907	15,801,084	19,919,362	18,000,707	6,329,477	9,203,929
Ship knees	3,619	3,157	2,295	4,236	5,153	15,175	8,232	2,547	4,134
Cedar	6,184	16,995	49,068	28,101	43,069	185,227	260,587	77,958	54,778
Mahogany	14,346	10,332	26,168	2,160	61,224	8,837	26,586	6,240	737
Pine joist, etc	754,943	454,236	278,712	444,701	560,422	500,076	683,431	208,471	486,808
Bay mahogany	166,639	160,460	210,029	72,923	8,713	963,171	18,143	194,896	306,524
Cypress	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black walnut	.....	10,551	.....	8,497	8,455	.....	.....	.....	.....
Satinwood	9,489	.....	.....	.....	.....	.....	.....	.....	.....
Baywood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hard pine boards, planks and timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahogany and cedar	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sycamore	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cherry	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	92,454	27,036	15,313	36,392	23,957	35,262	24,317	614	8,677
Hewn pine and pine ton timber, cubic ft	7,030	6,894	14,442	2,609	4,502	7,327	55,550	572	2,677

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH.—Continued.

Varieties.	From Oct. 1, 1884 to Oct. 1, 1885	From Oct. 1, 1885 to Oct. 1, 1886	From Oct. 1, 1886 to Oct. 1, 1887	From Oct. 1, 1887 to Oct. 1, 1888	From Oct. 1, 1888 to Oct. 1, 1889	From Oct. 1, 1889 to April 3, 1890	From April 5, 1890 to Dec. 31, 1890	From Jan. 1, 1891 to Dec. 31, 1891	From Jan. 1, 1892 to Dec. 31, 1892
White Pine	11,829,879	10,113,565	7,346,076	4,652,154	2,996,267	559,044	4,782,077	5,684,871	5,090,890
Spruce	39,477,482	38,358,890	38,183,573	31,899,090	25,808,843	7,124,067	38,868,356	35,944,160	31,310,434
Hemlock	6,773,267	8,410,474	8,263,810	6,013,086	6,264,151	1,312,070	7,975,783	5,176,136	5,335,884
Whitewood	13,597,670	15,833,802	9,947,807	9,374,429	7,572,219	1,943,270	7,662,942	11,332,718	11,545,163
Southern pine boards, planks and flooring	11,820,715	12,517,975	14,808,729	12,355,990	12,581,074	7,270,505	10,225,718	14,642,637	11,541,880
Hardwood, oak, ash, walnut, cherry	13,246,865	13,582,778	13,617,060	13,610,667	10,591,237	5,245,311	8,835,610	10,149,288	11,031,004
Ship knees	1,200	7,202	4,362	8,198	1,388	2,159	9,198	3,074	4,519
Cedar	863,976	256,460	426,963	250,866	241,314	212,926	84,376	130,104	17,189
Mahogany	184,378	216,825	376,158	280,350	64,292	9,023	3,056	3,596	.....
Pine joist, etc	101,108	.....	87,636	189,657	216,806	56,505	13,332	.....	25,320
Bay mahogany	502,013	156,635	130,699	45,504	.....	.....	10,768	19,216	.....
Cypress	.....	.....	.....	.....	.....	.....	1,343,572	2,782,712	4,569,024
Black walnut	.....	88	.....	.....	.....	.....	.....	.....	.....
Satinwood	.....	4,047	7,704	3,288	.....	.....	.....	.....	.....
Baywood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hard pine boards, planks and timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahogany and cedar	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sycamore	.....	.....	.....	.....	.....	.....	.....	5,951	.....
Cherry	7,748	.....	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	7,406[2]	8,315[2]	1,913[6]	11,405[4]	2,653[1]	1,793[2]	22,784	10,181[2]	11,142½
Hewn pine and pine ton timber, cubic ft	9,147[6]	4,465[2]	34,833[2]	2,240[4]	2,829	1,535[2]	102,153	90,568[2]	65,291

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH—Continued.

VARIETIES	From Jan. 1, 1893 to Dec. 31, 1893	From Jan. 1, 1894 to Dec. 31, 1894	From Jan. 1, 1895 to Dec. 31, 1895	From Jan. 1, 1896 to Dec. 31, 1896	From Jan. 1, 1897 to Dec. 31, 1897	From Jan. 1, 1898 to Dec. 31, 1898	From *Jan. 1, 1898 to Dec. 31, 1898	From Jan. 1, 1899 to Sept. 15, 1899	From Sept. 15, 1899 to Jan. 1, 1900
White Pine	3,466,162	2,708,029	2,627,625	2,646,500	4,616,187	1,878,942	353,131	2,200,071	2,189,336
Spruce	24,779,770	18,794,926	23,710,892	18,309,607	14,745,500	10,941,543	1,599,254	14,120,986	9,252,529
Hemlock	3,607,828	2,978,322	3,820,107	3,667,322	3,135,375	1,923,308	247,008	1,692,411	813,007
Whitewood	8,806,236	8,679,140	7,542,060	5,181,266	4,721,430	3,033,527	.....	3,061,952	1,463,805
Southern pine boards, planks and flooring	8,890,877	13,260,007	18,138,936	15,409,566	21,814,753	16,646,984	.....	13,674,553	5,741,282
Hardwood, oak, ash, walnut, cherry	8,609,139	8,411,136	8,412,394	5,087,316	4,587,903	4,337,610	.....	4,477,763	2,620,172
Ship knees	2,135	1,926	2,056	5,223	2,436	2,805	.....	5,029	206
Cedar	3,628	13,932	.....	.....	.....	.....	.....	.....	.....
Mahogany	.....	765	.....	.....	59,188	1,391,112	.....	.....	.....
Pine joist, etc	13,471	.....	.....	.....	.....	.....	.....	.....	.....
Bay mahogany	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cypress	4,665,931	3,925,763	8,812,379	8,295,707	10,755,205	8,517,184	.....	5,369,036	1,937,267
Black walnut	.....	.....	.....	.....	.....	.....	.....	.....	.....
Satinwood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Baywood	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hard pine boards, planks and timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahogany and cedar	.....	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....	213,249	94,531
Sycamore	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cherry	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	$261\frac{15}{16}$	$136\frac{12}{16}$	$74\frac{15}{16}$	$161\frac{9}{16}$	$168\frac{23.5}{16}$	$171\frac{13}{16}$	.....	$258\frac{28}{16}$	$87\frac{27}{16}$
Hewn pine and pine ton timber, cubic ft	$170\frac{35.5}{16}$	$54\frac{15}{16}$	.....	$35\frac{29}{16}$	$72\frac{28.5}{16}$	$20\frac{28}{16}$	.....	.....	.....

*United States Government.

AGGREGATES OF LUMBER SURVEYED IN THE FIRST MASSACHUSETTS DISTRICT FOR THE PERIOD 1860-1905, INCLUSIVE, COMPILED FROM THE RETURNS OF THE SURVEYOR GENERAL OF LUMBER DEPOSITED IN THE OFFICE OF THE SECRETARY OF THE COMMONWEALTH.—Continued.

VARIETIES.	From Jan. 1, 1900 to Jan. 1, 1901	From Jan. 1, 1901 to June 12, 1901	From June 12, 1901 to Jan. 1, 1902	From Jan 1, 1902 to Jan. 1, 1903	From Jan. 1, 1903 to Jan. 1, 1904	From Jan. 1, 1904 to Jan. 1, 1905	From Jan. 1, 1905 to Jan. 1, 1906
White Pine	6,636,535	2,037,496	3,286,168	5,685,121	7,229,129	6,383,030	7,252,243
Spruce	13,263,253	5,236,486	10,470,633	11,766,734	10,122,823	15,451,849	18,617,456
Hemlock	2,795,388	675,289	2,845,596	3,470,188	1,021,742	904,230	3,809,379
Whitewood	3,866,166	1,869,010	2,299,062	4,066,588	4,311,405	3,834,028	4,271,359
Southern pine boards, planks and flooring	4,885,020	8,012,697	9,200,364	20,690,754	16,783,555	12,108,847	13,702,243
Hardwood, oak, ash, walnut, cherry	7,362,689	3,228,452	3,729,418	7,507,235	7,659,679	7,757,856	9,109,341
Ship knees	4,386	1,538	589	1,286	2,135	419	2,030
Cedar	.....	.....	.....	.....	.....	.....	.....
Mahogany	.....	.....	.....	.....	.....	.....	.....
Pine joist, etc	.....	.....	.....	.....	.....	.....	.....
Bay mahogany	.....	.....	.....	.....	.....	.....	.....
Cypress	5,177,707	5,307,767	2,949,318	9,128,579	6,741,043	5,178,095	4,727,537
Black walnut	.....	.....	.....	.....	.....	.....	.....
Satinwood	.....	.....	.....	.....	.....	.....	.....
Baywood	.....	.....	.....	.....	.....	.....	.....
Hard pine boards, planks and timber	8,358,213	.....	.....	.....	.....	.....	.....
Mahogany and cedar	16,687	.....	.....	.....	.....	.....	.....
Redwood	.....	.....	.....	.....	.....	.....	.....
Sycamore	.....	.....	.....	.....	.....	.....	.....
Cherry	.....	.....	.....	.....	.....	.....	.....
Hardwood and oak ton timber, cubic ft	$166\frac{11}{40}$	$170\frac{23}{40}$	$70\frac{13\cdot 6}{40}$	$175\frac{23}{40}$	$161\frac{23}{40}$	$176\frac{23}{40}$	$102\frac{23}{40}$
Hewn pine and pine ton timber, cubic ft	.....	.....	.....	.....	.....	.....	.....
Hackmatack	.....	.....	.....	.....	.....	4,241	.....

HISTORY OF BOSTON SURVEY.

Survey laws were enacted, as recounted in a previous chapter, in the early part of the Nineteenth Century, by the terms of which all lumber received in the Boston district must be surveyed by a sworn surveyor, appointed by the Surveyor General of the State; and this surveyor was obliged to mark quality and contents on each piece with an iron stamp. This work required about forty deputies, who had practically steady employment. They were paid by the buyer thirty cents a thousand on spruce, pine and hemlock. The qualities of pine were, Nos. 1, 2, 3, 4, clear 5, coarse 5, and refuse. The lumber was cut all lengths and widths, and on pine the survey was exacting, and in the buyer's favor. To show how severe the survey was, an old Boston merchant says that he never saw 10,000 feet of eastern lumber that surveyed No. 1 on Boston inspection.

This system has been popularly known as "Boston Survey." The provisions of this law having become inadequate to the times, several years ago, through the efforts of leading Boston lumbermen, the law was amended and modernized and is still in force. The exactions of even the present legal inspection in Boston are still very high, but as Boston dealers are willing to pay a correspondingly higher price for their requirements much of the lumber sold in Massachusetts still passes under Boston survey.

In 1885 ex-Surveyor General George W. Cram, now deceased, prepared the following valuable reminiscences concerning the survey of lumber at Boston:

Previous to 1833 surveyors of lumber were appointed by the town or city authorities, and lumber was graded into two sorts, merchantable and refuse. When a cargo was sold, the buyer and seller agreed upon a surveyor, and he made the sorts according to his judgment. Under this system it was found that the price varied from $2 to $4 per thousand according to who made the survey, and the variation was so great that, in order to establish uniformity of sorts, the Boston city government in 1833 created the office of Surveyor General.

For many years prior to 1833 nearly all the lumber landed in Boston and vicinity was consigned to the late Edward D. Peters, who did the largest commission business in Boston.

The first Surveyor General was George W. Otis, who had previously been a lumber dealer. The firm was Otis & Thaxter, and its place of business was at the West End. Mr. Otis retained the office for ten years, was a member of the legislature in 1835, and lived to be over eighty years old.

His successor was Francis Bullard, who had also been a lumber dealer as one of the firm of C. & F. Bullard, whose wharf was at the foot of Summer or Broad Street. He held the office eight years.

The next Surveyor General was Charles Leighton, who held the office for one year, and who had been of the firm of Vinald & Leighton, lumber dealers at the West End. He held many responsible positions, and attained the ripe age of eighty years.

Mr. Leighton was succeeded by Oliver Frost, who held the office for one year.

Mr. Frost had formerly done a large wholesale lumber business. He was a member of the city government for several years and a State senator in 1860.

I was first appointed Surveyor General in 1855, and was reappointed in 1856, 1857 and 1858. Up to this time the term for Surveyor General had been one year, and he had received his appointment from the city. In 1859 the legislature passed an act creating the first Massachusetts lumber district, defining the various sorts of lumber, placing the appointment of the Surveyor General in the hands of the Governor, and increasing the term to three years. Between 1858 and 1861 there were three Surveyor Generals, two appointed by the city and one by Governor Banks.

Colonel Robert Cowdin, who held the office for a few months in 1861, was a lumber dealer of long standing, who left his business at the call to arms, in the stirring days of the Rebellion, and marched to the front at the head of a Massachusetts regiment. For his gallant conduct on the field he was brevetted brigadier general. He was a member of the board of aldermen for several years, and was identified with several good works. I was again appointed Surveyor General in 1861 by Governor Banks, and retained the office continuously till March 15, 1884, when the term of my appointment expired.

Mr. Cram died in April, 1893, at the age of eighty-eight years, bringing to an end a career remarkable in many respects. He was born in 1804 at Meredith, New Hampshire, and at the age of fifteen journeyed to Boston and apprenticed himself to a carpenter. At the age of twenty-one he began contracting on his own account, in which business he continued until 1835, when he was appointed deputy surveyor of lumber. After twenty years as a deputy Mr. Cram was appointed Surveyor General by Governor Henry J. Gardner in 1855, and held the position until 1884 with the exception of one term of three years, making, in all, twenty years as a deputy and twenty-six as a general, a total of forty-six years. During his service as Surveyor General he was absent from his office less than one day in the year in the entire term.

BOSTON SURVEY AS IN EFFECT IN 1906.

The following is the present Massachusetts State law for the inspection of lumber:

All lumber shall be inspected as the surveyor finds it, graded from both sides, and shall be measured for its true contents in the nearest number of feet of standard width and thickness. All tapering lumber shall be measured at the narrow end.

Unless otherwise specified, 10 feet and over long shall mean not to exceed 10 percent 10 feet; 8 feet and over long shall mean not to exceed 20 percent 8 and 10 feet; 6 feet and over long shall mean not to exceed 30 percent 6, 8 and 10 feet.

The word "clear" in the following definitions shall mean free from all defects, that is, bright or stained sap, knots, wormholes, rot, shakes, etc., unless otherwise specified.

All lumber grading poorer than culls shall be classed as mill culls.

Badly missawn lumber shall be classed as culls.

Scant sawn lumber shall be reduced to the next standard thickness.

Any lumber shipped on special contracts, embracing special grades, thicknesses, widths, or lengths, shall be inspected according to such contract, irrespective of the standard rules.

PLAIN SAWED OAK.

Grades.—No. 1, No. 2, common culls.

Thicknesses.—Five-eighths, 1, 1¼, 1½, 2, 2½, 3, and 4 inches.

Standard Defects.—A sound knot not to exceed 1¼ inches in diameter, or its equivalent; 2 inches of bright sap; a split in excess of the width of the board; wormholes not exceeding in extent or damage a 1¼-inch knot.

No. 1.—No. 1 shall be 10 feet and over long, 6 inches and over wide, and clear up to 10 inches. Pieces 10 inches to 15 inches wide will admit one standard defect; 15 inches to 18 inches wide, two standard defects; 18 inches and over wide, three standard defects. One knot defect only will be admitted in this grade.

No. 2.—No. 2 shall be 10 feet and over long and 6 inches and over wide. Pieces 6 inches to 8 inches wide must have one clear face, but will admit one standard defect on back side. Pieces 8 inches to 10 inches wide will admit one standard defect; 10 inches to 15 inches wide, two standard defects; 15 inches and over wide, three standard defects. This grade will admit not over five percent clear pieces 8 feet long, 10 inches and over wide.

Common.—Common shall be 8 feet and over long, 4 inches and over wide. Pieces under 5 inches wide must have one clear face. Pieces 5 inches wide will admit one standard defect. Pieces 6 inches and over must cut 75 percent clear, in pieces not less than 4 inches wide and 3 feet long. Bright sap is no defect. This grade will admit not over five percent clear pieces 6 feet long, 5 inches and over wide.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide. Each piece must cut 50 percent clear, in pieces not less than 3 inches wide and 2 feet long. Bright sap is no defect.

Clear Strips.—Clear strips shall be 8 feet and over long, 3 to 6 inches wide, and have one face and two edges clear, inspected on the best side. Not over five percent can be under 10 feet.

SOUTHERN POPLAR, OR WHITEWOOD.

Grades.—No. 1, No. 2, bright saps, common, stained saps, culls.

Thicknesses.—Five-eighths, ¾, 1, 1¼, 1½, 2, 2½, 3 and 4 inches.

Standard Defects.—A knot not to exceed 1¼ inches in diameter, or its equivalent; a split in excess of the width of the board; other imperfections, such as wormholes, gum specks, etc., not exceeding in extent or damage a 1¼-inch knot.

No. 1.—No. 1 shall be 10 feet and over long, 8 inches and over wide, clear up to 10 inches and clear of knots up to 16 inches. Pieces 16 inches and over wide will admit one standard defect. A small amount of bright sap will be admitted in this grade, but shall be confined to the sap side in pieces 11 to 16 inches wide. At 16 inches and over wide bright sap will be admitted on both faces, but in no case shall the total amount of sap found on both sides combined exceed 25 percent of the width of the board.

No. 2.—No. 2 shall be 10 feet and over long, 8 inches and over wide, and have one face clear up to 10 inches wide. In the absence of sap, knots of standard size will be admitted as follows: Pieces 10 and 11 inches wide will admit one knot; 12 to 16 inches wide, two knots; 16 inches and over wide, three knots.

Bright sap will be admitted in this grade to the extent of 33⅓ percent of the width of piece, if clear of knots. When both knots and sap appear, one knot shall be considered equal to 2 inches of sap. Pieces 20 inches and over wide, if free from all other defects, will admit bright sap without limit on one face only.

Bright Saps.—Bright saps shall be 10 feet and over long, 5 inches and over wide, and free from all defects, except bright sap.

Common.—Common shall be 8 feet and over long, 6 inches and over wide. Two-

thirds of each board must be clear, except bright sap, when cut into pieces not less than 2 feet long and the full width of the board.

Stained Saps.—Stained saps shall be 10 feet and over long, 5 inches and over wide and free from all defects, except sound stained sap.

Culls.—Culls shall be 8 feet and over long, 4 inches and over wide, and must cut 50 percent clear face, except sap, in pieces not less than 2 feet long and 4 inches wide.

Strips.—Strips shall be 10 feet and over long, 4 to 8 inches wide. No. 1 shall have one clear heart face and clear on back side, except bright sap. No. 2 shall be clear, except bright sap.

Blue growth, or log stain, shall be excluded from No. 1, No. 2, and bright saps. Slightly discolored sap shall be admitted, if in the inspector's judgment it is of no greater damage than a 1¼-inch knot.

POPLAR SQUARES.

Boxed hearts shall not be admitted. Splits 6 inches in length shall not be considered a defect. Splits over 12 inches in length will reduce the square one grade. Lengths shall be 8, 9, 10, 12, 14 and 16 feet.

No. 1.—Four by four inches, 5x5 inches must be clear; 6x6 inches and 7x7 inches will admit of ½ inch of bright sap on each of the two faces of one corner; 8x8 inches and 9x9 inches will admit 1 inch of bright sap on each of the two faces of one corner; 10x10 inches and over will admit 1½ inches of bright sap on each of the two faces of one corner.

No. 2.—No. 2 will admit of one knot, and bright sap, but each face must show not less than half heart.

Turning Squares.—Turning squares must be free from knots, but will admit of bright sap without limit.

Common.—Common will admit of sound sap without limit. In lengths 8 to 12 feet will admit of not over two knots, or their equivalent. In 12 feet and over will admit three knots. Slight season checks admitted in this grade.

Culls.—Culls must cut 50 percent clear, except sap, in pieces not less than 2 feet long.

COTTONWOOD.

Grades.—No. 1, No. 2, select common, common, culls.

Thicknesses.—One-half inch, ⅝ inch, ¾ inch, 1 inch, 1¼ inches, 1½ inches, 2 inches, 2½ inches, 3 inches, and 4 inches.

Standard Defects.—A sound knot 1¼ inches in diameter, or its equivalent. Bright sap shall not be considered a defect.

No. 1.—No. 1 shall be 12 feet and over long, 8 inches and over wide, and clear up to 13 inches. Pieces 13 inches and over wide will admit one standard defect.

No. 2.—No. 2 shall be 10 feet and over long, 8 inches and over wide. Pieces 8 to 13 inches wide will admit one standard defect; 13 to 18 inches, two standard defects; 18 inches and over, three standard defects.

Select Common.—Select common shall be 10 feet and over long, 6 inches and over wide, and clear up to 8 inches. Pieces 8 inches to 13 inches wide will admit one sound knot not exceeding 2 inches in diameter; 13 inches and over wide, two such knots, but all pieces must cut 75 percent clear in pieces not less than 2 feet long and the full width of the piece. Slightly discolored sap is no defect.

Common.—Common shall be 8 feet and over long, 4 inches and over wide, and clear up to 6 inches. Pieces 6 inches and over wide must cut 75 percent clear in pieces not less than 2 feet long, and the full width of the piece.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide, and must cut 50 percent clear in pieces not less than 2 feet long and 4 inches wide.

SQUARES.

No. 1.—No. 1 shall be 8 feet and over long, and clear of all defects.

No. 2.—No. 2 shall be 8 feet and over long. Four-inch, 5-inch and 6-inch squares will admit one sound standard defect; 7-inch, 8-inch, 10-inch and 12-inch squares will admit two sound standard defects.

Common.—Common shall be 8 feet and over long, and will admit sound knots, slightly stained sap, pin wormholes, small season checks, and splits not exceeding 12 inches in length, but 75 percent in one piece of each square must be suitable for turning purposes.

GUM—PLAIN SAWED.

Grades.—No. 1, No. 2, common culls.

Thicknesses.—Three-eighths, ½, ⅝, ¾, 1, 1½, 2, 2½, 3 and 4 inches.

Standard Defects.—A sound knot 1¼ inches in diameter, or its equivalent; a split in excess of the width of the board; 1 inch of bright sap.

No. 1.—No. 1 shall be 10 feet and over long, 8 inches and over wide, and clear up to 10 inches. Pieces 10 inches and over wide will admit one standard defect.

No. 2.—No. 2 shall be 10 feet and over long, 6 inches and over wide. Pieces 6 to 8 inches wide must be clear. Pieces 8 to 10 inches wide will admit one standard defect; 10 to 13 inches wide will admit two standard defects; 13 inches and over wide, three standard defects.

Common.—Common shall be 8 feet and over long, 4 inches and over wide. Pieces under 5 inches wide must have one clear face. Pieces 5 inches wide will admit one standard defect. Pieces 6 inches and over wide must cut 75 percent clear, in pieces not less than 4 inches wide and 3 feet long.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide. Each piece must cut 50 percent clear, in pieces not less than 3 inches wide and 2 feet long.

BROWN ASH, WHITE ASH, BASSWOOD, BEECH, BIRCH, CHESTNUT, ROCK ELM, SOFT ELM, HICKORY, ROCK MAPLE, SOFT MAPLE AND PLAIN SAWED SYCAMORE.

Grades.—No. 1, No. 2, common, culls.

Thicknesses.—Five-eighths, 1, 1¼, 1½, 2, 2½, 3 and 4 inches.

Standard Defects.—A sound knot 1¼ inches in diameter, or its equivalent; a split in excess of the width of the board; other imperfections such as wormholes, etc., not exceeding in extent or damage a 1¼-inch knot. Bright sap shall not be considered a defect.

No. 1.—No. 1 shall be 10 feet and over long, 6 inches and over wide, and clear up to 10 inches. Pieces 10 to 18 inches wide will admit one standard defect; 18 inches and over wide, two standard defects.

No. 2.—No. 2 shall be 10 feet and over long, 6 inches and over wide. Pieces 6 to 10 inches wide will admit one standard defect on one face. Pieces 10 to 18 inches wide will admit two standard defects; 18 inches and over wide, three standard defects. This grade will admit not over five percent clear pieces 8 feet long, 10 inches and over wide.

Common.—Common shall be 8 feet and over long, 4 inches and over wide. Pieces under 5 inches wide must have one clear face. Pieces 5 inches wide will admit one standard defect. Pieces 6 inches and over wide must cut 75 percent clear, in pieces not less than 4 inches wide and 3 feet long. This grade will admit clear pieces 6 and 7 feet long, 5 inches and over wide.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide. Each piece must cut 50 percent clear, in pieces not less than 3 inches wide and 2 feet long.

Clear Strips.—Clear strips shall be 8 feet and over long, not exceeding five percent 8 feet, 3 to 6 inches wide, and have one face and two edges clear.

(Note.—Special grade in chestnut.)

Sound wormy shall be 6 feet and over long, not over 10 percent under 8 feet, 5 inches and over wide, and shall be sound. Pin wormholes in this grade no defect. Grub holes not admitted.

(Note.—Special grade in birch and beech.)

Red birch and red beech shall be inspected as ordinary birch and beech, except that each piece shall have 75 percent or more red on one face, inspected on the best side. Four and 5-inch strips shall have one face all red.

CHERRY, BLACK WALNUT, BUTTERNUT.

Grades.—No. 1, No. 2, common, culls.

Thicknesses.—Three-eighths, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

Standard Defects.—A knot not to exceed $1\frac{1}{4}$ inches in diameter, or its equivalent; 1 inch of bright sap; a split in excess of the width of the board; other imperfections not exceeding in extent or damage a $1\frac{1}{4}$-inch knot.

No. 1.—No. 1 shall be 10 feet and over long, not exceeding 15 percent 10 feet, 6 inches and over wide. This grade must have one face free from sap. Pieces 6 to 8 inches wide must be clear; 8 to 10 inches wide will admit one sap defect; 10 to 12 inches wide, two sap defects; 12 to 15 inches wide, three sap defects and one knot defect; 15 inches and over wide, four sap defects and one knot defect.

No. 2.—No. 2 shall be 8 feet and over long, not exceeding 15 percent each 8 and 10 feet, 6 inches and over wide. This grade must have one face free from sap up to 12 inches wide. Pieces 12 inches and over wide will admit one sap defect. On the opposite side, sap will be admitted as follows: Pieces 6 to 8 inches wide, one sap defect; 8 to 10 inches wide, two sap defects; 10 inches and over wide, three sap defects. Pieces 8 to 12 inches wide will admit one knot defect 12 inches and over wide, two knot defects.

Common.—Common shall be 8 feet and over long, 4 inches and over wide. Pieces under 5 inches wide must have one clear face. Pieces 5 inches wide will admit one standard defect. Pieces 6 inches and over wide must cut 75 percent clear, in pieces not less than 4 inches wide and 3 feet long. Shall include not exceeding 10 percent clear, in pieces 6 and 7 feet long, 5 inches and over wide.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide. Each piece must cut 50 percent clear, in pieces not less than 3 inches wide and 2 feet long.

(Note.—Gum specks and streaks in cherry are very serious defects and should be treated by the inspector accordingly.)

OAK, GUM, SYCAMORE—QUARTER-SAWED.

Grades.—No. 1, No. 2, common, culls.

Thicknesses.—Three-eighths, $\frac{5}{8}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3 and 4 inches.

Standard Defects.—A sound knot $1\frac{1}{4}$ inches in diameter, or its equivalent; 1 inch of bright sap; wormholes not exceeding in extent or damage a $1\frac{1}{4}$-inch knot. Stains, streaks and knots on edges of boards are considered defects and should be treated accordingly. All quarter-sawed oak shall be figured on one face.

No. 1.—No. 1 shall be 10 feet and over long, 6 inches and over wide and clear up to 8 inches. Pieces 8 inches and over wide will admit one standard defect.

No. 2.—No. 2 shall be 10 feet and over long, 6 inches and over wide. Pieces 6 to 8 inches wide will admit one standard defect. Pieces 8 to 10 inches wide will admit 1 inch bright sap and one other standard defect. Pieces 10 to 12 inches wide will admit

two standard defects; 12 inches and over wide, three standard defects. In surveying gum, No. 1 and No. 2, substitute 5 inches for 6 inches.

Common.—Common shall be 8 feet and over long, 4 inches and over wide, not exceeding 25 percent under 6 inches wide. Pieces 4 and 5 inches wide will admit one standard defect. Pieces 6 inches and over wide, 8 and 10 feet long, must cut 75 percent clear, in not over two pieces. Pieces 6 inches and over wide, 12 feet and over long, must cut 75 percent clear, in not over three pieces. No piece of cutting considered which is less than 4 inches wide and 2 feet long. Bright sap without limit, and pieces 6 and 7 feet long, 5 inches and over wide shall be admitted to this grade. In surveying gum, common, bright sap is a defect.

Culls.—Culls shall be 6 feet and over long, 3 inches and over wide, not exceeding 40 percent under 6 inches wide. Pieces 6, 8 and 10 feet long must cut 50 percent clear in not over three pieces; 12 feet and over long must cut 50 percent clear in not over four pieces. No piece of cutting considered which is less than 3 inches wide and 2 feet long. Bright sap is no defect in this grade. In surveying gum, culls, bright sap is a defect.

Oak Strips.—Clear strips shall be 8 feet and over long, not exceeding 10 percent 8 feet, 2½ to 6 inches wide, clear one face. No. 1 shall be 8 feet and over long, not exceeding 10 percent 8 feet, 3 to 6 inches wide, clear of all defects except ½ inch of bright sap on one side, and shall be inspected on the best side. No. 2 shall be 8 feet and over long, not exceeding 10 percent 8 feet, 3 to 6 inches wide, and clear except bright sap. on one face. Equalized strips shall be 10 feet and over long, 3, 3½, 4, 4½, 5 and 5½ inches wide, clear of wane, bevel, bright sap, and all other defects on one face.

CYPRESS.

Cypress lumber should be well manufactured, square-edged and butted, and sawed plump enough in width and thickness to allow for shrinkage and dressing. It shall be graded as No. 1, or choice and prime, No. 2, or merchantable, sidings, and culls.

The length of all grades higher than culls shall be 10 feet and up, and the width 7 inches and up.

A knot defect shall be equal to a sound knot 1½ inches in diameter. A sap defect shall be equal to 1 inch of sap the entire length of piece on one side.

No. 1, or Choice and Prime.—Shall include choice lumber which shall be clear of all defects, and all lumber over 8 inches wide, clear of all defects on one side, which does not show over one-eighth sap on each or either edge on the other side.

No. 2, or Merchantable.—At 7 inches wide will admit one defect. At 10 inches wide will admit two defects. At 12 inches wide will admit three defects. At 16 inches and up wide, will admit four defects on face side. But in all widths must show one-half heart on sap side.

Sidings.—Sidings should be clear of all defects except bright or unstained sap. In not over 15 percent of lumber, one or two small knots may be allowed on one face.

Rejects.—Rejects shall include all lumber 7 inches and up wide, 8 feet and over long, that will not go in the grade of first and second clear, and sidings, but that will cut 60 percent clear of waste.

Culls.—All cypress lumber not up to the above standards of grade. No cull will have a marketable value which will not work on half its size without waste.

Tank Stock.—Tank stock 10 feet and up in length, narrow or wide, shall be clear of all defects except sap that will dress off, and one or two small knots which must be sound and water tight.

Strips.—Strips shall be 4, 5 and 6 inches wide, 10 feet and up in length, and clear of all defects, except sap. No. 1 strips shall have one side clear of sap. No. 2 strips will admit sap on face side.

Gutter Scantling and Joist.—Standard sizes 3x4, 4x5, 4x6 and 5x7; length 12 to 35 feet. All gutter stock should be sawed $\frac{1}{8}$ inch over each intended size.

No. 1 shall be free from all defects except sap that will work off in moulding.

No. 2 shall be free from large or unsound knots and other defects that will prevent its whole use in ordinary work, or two-thirds of the same in one piece, as No. 1 stock.

Culls.—All lumber not up to standard of No. 2 grade.

NORTH CAROLINA PINE—SHORTLEAF.

Rules in use on this market, known as the Norfolk, Virginia, rules, should govern here.

All lumber shall be well manufactured and well kiln-dried. The basis of inspection shall be the best or face side of each board.

No. 1.—No. 1 grade under 12 inches wide shall have one side clear of all defects, except five percent of pitch streak. The other side to grade up to No. 2 board. Lumber over 12 inches wide, in addition to the pitch streaks, shall permit of one pitch pocket or tight knot, not to exceed $\frac{1}{2}$ inch in width for every additional 3 inches in width.

No. 2.—No. 2 grade shall consist of boards with small tight knots on the best side, and permit of 15 percent of pitch streaks, the other side to grade No. 3 or better. No knot in a board up to 6 inches wide to exceed 1 inch in width, and in boards above that width no knot to exceed $1\frac{1}{2}$ inches in width. The aggregate width of knots not to exceed $1\frac{1}{4}$ inches to every 3 inches in width of the board. Pitch pockets to be treated the same as knots.

No. 3.—No. 3 grade shall consist of tight knotted boards below the grade of No. 2, with clear edges on the best face. Stock boards shall have one edge clear, one-fourth the width of the board on the best face. No knot in a board up to 4 inches wide to exceed $1\frac{1}{2}$ inches in width, up to 6 inches wide $1\frac{3}{4}$ inches and above that width 2 inches, black pin knots, pinney boards that would otherwise grade as No. 1 or No. 2, No. 1 showing 50 percent of pitch, No. 2 showing 25 percent of pitch are admissible, the reverse side to grade equal to box.

Box.—Box grade shall consist of coarse knotted boards, pinney and pitchy boards that would otherwise grade as No. 2 or No. 3.

Width of Lumber.—No. 3 and box edge, 4 inches and up; 4-4 No. 1 and 2 edge, 3 inches and up; 5-4 No. 1 and 2 edge, 4 inches and up; 6-4 and 8-4 No. 1 and 2 edge, 6 inches and up. Standard length 10, 12, 14 and 16 feet.

YELLOW OR HARD PINE—LONGLEAF.

No change asked from present law as to boards and plank. Savannah rules to govern as to timber.

Classification.—Flooring shall embrace 4 and 5 quarter inches in thickness by 3 and 6 inches in width. For example: 1x3, 4, 5 and 6.

Boards shall embrace all thicknesses under $1\frac{1}{2}$ inches by 7 inches and up wide, including $1\frac{1}{2}$ inches in thickness by 7 inches in width. For example: $\frac{3}{4}$, 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ inches thick by 7 inches and up wide.

Scantling shall embrace all sizes from 2 to 5 inches in thickness and 2 to 6 inches in width. For example: 2x2, 2x3, 2x4, 2x5, 2x6, 3x3, 3x4, 3x5, 3x6, 4x4, 4x5, 4x6; 5x5 and 5x6.

Plank shall embrace all sizes from $1\frac{1}{2}$ to 5 inches in thickness by 7 inches and up in width. For example: $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$ and 5x7 and up wide.

Dimension sizes shall embrace all sizes 6 inches and up in thickness by 7 inches and up in width, including 6x6. For example: 6x6, 6x7; 7x7, 7x8; 8x8, 8x9 and up.

Stepping shall embrace 1 to $2\frac{1}{2}$ inches in thickness by 7 inches and up in width. For example: 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2 and $2\frac{1}{2}$x7 and up wide.

Rough edge or flitch shall embrace all sizes 1 inch and up in thickness by 8 inches and up in width, sawed on two sides only. For example: 1, 1½, 2, 3, 4 and up thick by 8 and up wide, sawed on two sides only.

Square-edge Inspection.—Flooring shall show no wane, shall be free from through or round shakes or knots exceeding 1½ inches in diameter, or more than six in a board; sap no objection.

Boards shall show no wane, shall be free from round or through shakes, large or unsound knots; sap no objection.

Scantling shall be free from injurious shakes, unsound knots, or knots to impair strength; sap no objection.

Plank shall be free from unsound knots, wane, through or round shakes; sap no objection.

Dimension Sizes.—Sap no objection; no wane edges, no shakes to show on outside of stick.

All stock to be well and truly manufactured, full to sizes and saw-butted.

Merchantable Inspection.—Flooring shall show one heart face regardless of sap on opposite side, free from through or round shakes or knots exceeding 1 inch in diameter or more than four in a board on the face side.

Boards 9 inches and under wide shall show one heart face and two-thirds heart on opposite side; over 9 inches wide shall show two-thirds heart on both sides, all free from round or through skakes, large or unsound knots.

Scantling shall show three corners heart, free from injurious shakes or unsound knots.

Plank 9 inches and under wide shall show one heart face and two-thirds heart on opposite side; over 9 inches wide shall show two-thirds heart on both sides, all free from round or through shakes, large or unsound knots.

Dimension Sizes.—All square lumber shall show two-thirds heart on two sides, and not less than one-half heart on two other sides. Other sizes shall show two-thirds heart on faces, and show heart two-thirds of the length on edges, excepting where the width exceeds the thickness by 3 inches and over, then it shall show heart on the edges for one-half the length.

Stepping shall show three corners heart, free from shakes and all knots exceeding ½ inch in diameter and not more than six in a board.

Rough edge or flitch shall be sawed from good heart timber, and shall be measured in the middle, on the narrow face, free from injurious shakes or unsound knots.

All stock to be well and truly manufactured, full to sizes and saw-butted.

Prime Inspection.—Flooring shall show one entire heart face and two-thirds heart on the opposite side, clear of splits, shakes or knots exceeding 1 inch in diameter or more than four in a board.

Boards shall show one heart face and two-thirds heart on opposite side, free from shakes and large or unsound knots.

Scantling shall show three corners heart, and not to exceed 1 inch of sap on fourth corner, measured diagonally, free from heart shakes, large or unsound knots.

Plank shall show one entire heart face; on opposite face not exceeding one-sixth its width of sap on each corner, free from unsound knots, through or round shakes, sap to be measured on face.

Dimension Size.—On all square sizes the sap on each corner shall not exceed one-sixth the width of the face. When the width does not exceed the thickness by 3 inches, to show half heart on narrow faces the entire length; exceeding 3 inches, to show heart on narrow faces the entire length; sap on wide faces to be measured as on square sizes.

Rough edge or flitch shall be measured in the middle on narrow face, inside of sap, free from shakes or unsound knots.

Clear Inspection.—Flooring, stepping and boards shall be free of knots, sap, pitch and all other defects.

Scantling shall be free of sap, large knots and other defects.

Plank shall be free of sap, large knots or other defects.

Dimension sizes shall be free from sap, large or unsound knots, shakes through or round.

Designations of the Trade.—Resawed lumber—lumber sawn on four sides.

Rough edge or flitch—lumber sawn on two sides.

Timber—hewn only.

WESTERN PINE.

Western pine boards and plank will be inspected as first, second and third clear, or uppers, selects, fine common, No. 1 and No. 2, cut-ups, common, wide common and culls.

All boards and plank above the grade of culls shall be well manufactured, parallel in width (if tapering to be measured at the narrow end). All boards 1 inch and under thick shall be measured face measure.

All lumber in grade above common shall be thick enough to plane as follows: One inch to plane two sides to $\frac{7}{8}$ inch; $1\frac{1}{4}$ inch to plane two sides to $1\frac{1}{8}$ inch; $1\frac{1}{2}$ inch to plane two sides to $1\frac{3}{8}$ inch; 2 inch to plane two sides to $1\frac{7}{8}$ inch. All lumber in grade of common should be the same thickness, but if thick enough to plane one side the thickness above specified will not be reduced in grade. All lumber sawed scant in thickness shall be reduced to the next standard thickness except inch, which shall be graded as culls, unless otherwise specified.

Culls, if tapering, shall be measured in the middle of the piece, giving full contents. Western pine lumber shall be so specified on inspection statement.

A sap defect shall be equal to 1 inch in width the entire length of piece on one side. In selects and upper grades, white sap is the defect admitted, and in fine common and under grades, discolored sap is admitted.

A knot defect shall be equal to a sound knot $\frac{3}{4}$ inch in diameter.

A split defect shall be equal to a straight split 2 feet in length and parallel with the edge of the board.

A shake defect shall be equal to 1 square foot of surface, and not over 4 feet in length.

First clear shall be not less than 12 feet long, 12 inches wide, of soft white pine, and free of defects, at 18 inches wide and up, two white sap defects may be admitted on one side.

Second clear shall be not less than 12 feet long, 10 inches wide and free of defects, at 12 inches wide one white sap, or one knot defect, and at 18 inches and up wide three white sap, or three knot defects may be admitted on one side.

Third clear shall be not less than 12 feet long, 8 inches wide and free of defects, at 12 inches wide two white sap, or two knot defects, and at 18 inches and up wide, four white sap or four knot defects may be admitted on one side.

Lumber that will grade as uppers at 12 inches wide with one split defect, or at 18 inches wide with two split defects, shall be reduced to selects; with more split defects, to fine common.

Selects shall be 12 feet long (except that 10 percent of 10-foot lengths may be allowed) 7 inches and up wide, white sap on outside shall not exceed two-thirds the width of piece. At 12 inches wide two white sap, one knot, or one split defect may be admitted on face side, but white sap shall not cover over two-thirds of sap side. At

18 inches and up wide, four white sap, three knot, or one knot, with two split defects may be admitted on face side, and white sap not to exceed one-third or sap side. No shakes admitted in this or upper grades.

Fine common shall be 12 feet long (10 percent of 10-foot lengths allowed) 7 inches and up wide; white sap defects may be allowed equal to two-thirds of face on sap side, and one-third on face side, at 12 inches wide, white sap one-third of face side, and three knot or two split defects; at 18 inches wide and over, sap one-third of face and five knot, or three split defects. A slight shake admitted in this grade.

No. 1 cut-ups shall be 8 feet and up long, 7 inches and up wide. This grade shall include all lumber where two-thirds of the same equal to the upper grades can be obtained by cutting, the shortest piece to be not less than 3 feet long.

No. 2 cut-ups shall be 8 feet long, and 6 inches wide and the same as No. 1 cut-up, with the exception that the lumber obtained shall be equal to one-half of the piece, the shortest cut to be 2 feet long.

The standard length that admits knot defects in second and third clear, selects, fine common and cut-ups is 16 feet.

Common shall be 12 feet long (10 percent of 10-foot lengths allowed), 7 inches and up wide, and include all boards and plank that are well manufactured, of full thickness, sound character, and that contain small tight knots that will not prevent the whole piece being used for ordinary shelving, or good matching work without waste.

Wide common, or coffin boards, shall include all boards of the above quality 14 feet and up long, and 14 inches and up wide.

Culls shall include all boards and plank 8 feet and up long, 4 inches and up wide, not up to the standard of common, when not less than two-thirds of the piece (as a whole) can be used for coarse matching purposes; or the whole piece having good edges with narrow rot streaks, and other defects that will not prevent its being used for coarse boxing purposes.

All boards not up to this standard shall be graded as mill culls.

EASTERN PINE INSPECTION.

Eastern pine boards and planks shall be inspected as No. 1, No. 2, No. 3, No. 4, clear 5, No. 5, refuse and outs. No. 1 the same as first clear, western pine inspection. No. 2, the same as second clear, western pine inspection. No. 3, the same as third clear, western pine inspection. No. 4 shall include all lumber practically free from rot, shakes, discolored sap, and bad knots, that is suitable for outside finish; small, sound, red knots admitted in this grade.

Clear 5 shall include bright sap lumber not up to the standard of No. 3, nearly free from knots on face side. A small amount of discolored sap will be admitted on sap side, and only a slight shake.

No. 5, or coarse 5, shall include all lumber of full thickness, sound character, and may contain sound red knots. The whole piece must be suitable for ordinary shelving or matching purposes, with less than one-third waste; a slight shake admitted in this grade.

Boards 8 inches and up wide, 12 feet and up long, of this quality are denominated Boston shippers.

A grade coarser than the above, admitting larger and branch knots, but of sound character and generally water tight, is denominated West India shippers.

Only a slight stain, shake or split admitted in the grade of shippers.

Refuse shall include all boards not less than 10 feet and up long, 6 inches and up wide, not up to the standard of No. 5, of generally sound character. Defects admitted that will not prevent its use for matching, boxing, or similar coarse purposes.

Outs shall include all eastern and norway pine lumber, containing rot, bad sap, shakes, wormholes, wane, splits and other defects, which can be used without more than one-half waste for coarse ordinary purposes; also short and narrow pieces of equal quality to refuse.

Poor outs, all lumber not up to the standard of outs, and practically worthless.

Norway pine shall be graded the same as white pine, but shall be specified as norway on inspection statement.

Box boards, waney-edge box boards, pine, bass, poplar and spruce, shall be inspected as good and culls.

Good shall include all sound lumber so free from black, moldy, or rotten sap, rot, wormholes, and bad shakes, that not less than two-thirds of entire piece (as a whole) can be used without waste.

Culls shall include all lumber not good enough for the above grade.

RULES FOR THE INSPECTION OF SPRUCE AND HEMLOCK (EASTERN).

Spruce floors shall be inspected as first clear, second clear, merchantable and culls.

All boards shall be well manufactured, square-edged and square-butted, and thick enough when dry to plane one side 13-16 of an inch.

All boards not up to the required thickness, shall be graded as culls.

A standard board shall be 6 inches wide and 16 feet long.

All boards, first and second clear, that taper, shall be measured at the narrow end.

The knot defects hereinafter described shall be those allowed in a clear board of standard size.

Knot defects in all boards, other than of standard size, shall be in the same proportion.

White sap is no defect.

First clear shall not be less than 10 feet long and 4 inches wide

In a standard board defects on the face side may be admitted equal to four sound pencil knots, and on sap side, equal to one-half of light blue sap.

No wane shall be allowed that will not dress off.

Second clear shall not be less than 10 feet long, or 4 inches wide.

In a standard board, defects on the face side may be admitted equal to six sound knots, ½ inch in diameter, or if clear of knots, 1 inch in width of light blue sap the entire length of the board.

Light blue sap may cover the whole of the sap side.

Wane shall not be admitted on either edge of sap side, over ½ inch in width.

Merchantable boards shall not be less than 8 feet long, and 4 inches wide, of sound character and free of knots, wane, splits and rot, or other defects that will impair its strength, or prevent its use for ordinary purposes without waste.

Shippers shall include all boards of merchantable quality, 10 feet and up long, 8 inches and up wide.

Culls shall include all boards not up to the above standard.

Boards less than 4 inches and not less than 3 inches, shall be classed as narrow merchantable.

All spruce over 1 inch in thickness shall be inspected as merchantable and culls.

Merchantable shall be lumber of sound character, well manufactured, and practically free from wane, shake and shell, suitable for ordinary work without waste, and not less than 10 feet long.

Merchantable hemlock shall be of sound character, square edged, free from bad shakes, rot, and loose or unsound knots, that will impair its strength, or render it unfit for work without waste, 10 feet and up long, and 6 inches and up wide.

Culls shall include anything in spruce and hemlock not up to the above grading.

VERMONT SPRUCE.

Grades.—Clear, No. 1, No. 2, No. 3.

Thicknesses.—One inch, 1¼ inches.

Standard Defects.—A sound knot 1 inch in diameter, or its equivalent in pin knots. Bright sap shall not be considered a defect.

Clear.—Clear shall be 10 feet and over long, 4 inches and over wide, and clear up to 7 inches. Pieces 7 inches and over wide will admit two pencil knots.

No. 1.—No. 1 shall be 10 feet and over long, 4 inches and over wide, and will admit one standard defect, but must be smoothly dressed and free from wane.

No. 2.—No. 2 shall be 10 feet and over long, 4 inches and over wide, and sound knotted, but pieces 6 inches and over wide will admit one standard knot hole.

No. 3.—No. 3 shall be 10 feet and over long, 4 inches and over wide, and will admit unsound knots and knot holes.

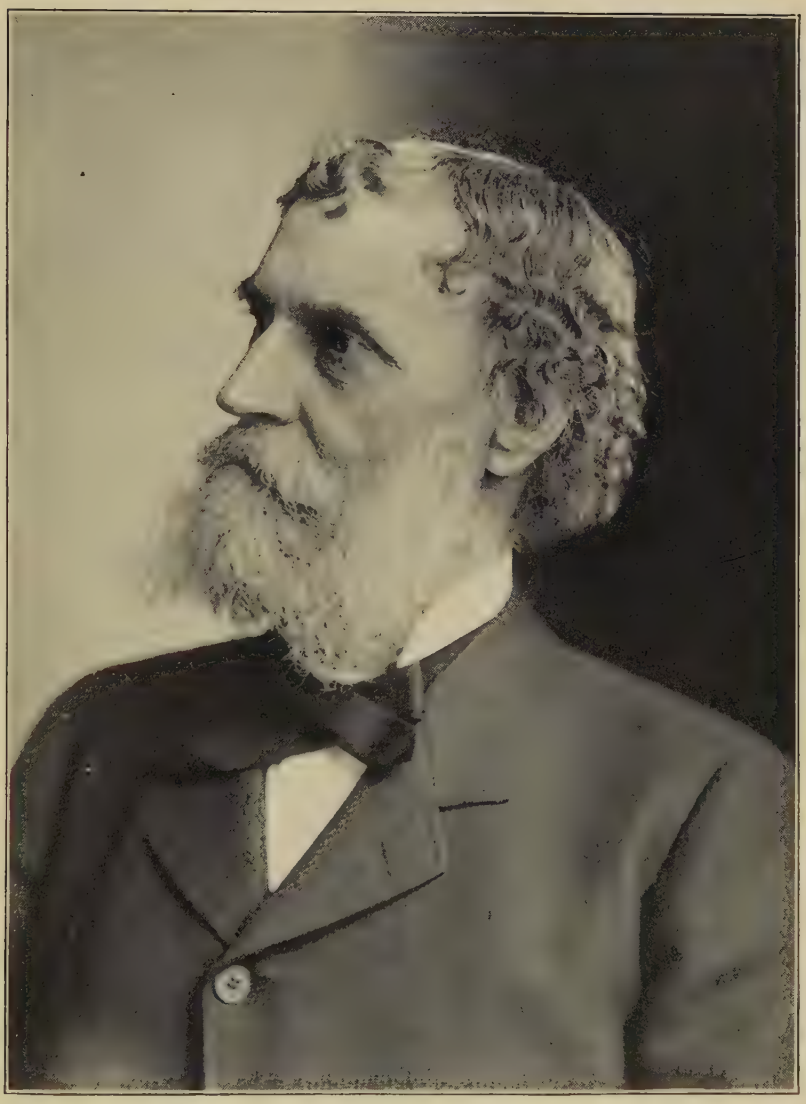
PENNSYLVANIA HEMLOCK.

Grades.—No. 1, No. 2.

Thicknesses.—One inch, 2 inches, 3 inches.

No. 1.—No. 1 shall be 12, 14 and 16 feet long, 6 inches, 8 inches, 10 inches and 12 inches wide, free from rot, loose knots and knot holes; will admit sound knots that do not impair the strength, one straight split not exceeding one foot in length, or a slight shake that does not pass through the piece.

No. 2.—No. 2 shall be 12, 14, 16 feet long, 6 inches, 8 inches, 10 inches and 12 inches wide, and will admit loose and rotten knots, knot holes, one straight split not exceeding two feet in length, and small dark colored and rotten streaks, but boards in this grade should work the full size for coarse purposes, without serious waste.



SOLOMON ADAMS WOODS

A PIONEER IN THE INVENTION AND IMPROVEMENT OF WOODWORKING MACHINERY
BORN AT FARMINGTON, MAINE, OCTOBER 5, 1827. DIED AT BROOKLINE, MASSACHUSETTS, OCTOBER 1, 1907

CHAPTER XVII.

MASSACHUSETTS—STATISTICAL.

Despite the industrial and commercial activity of Massachusetts from its settlement to the present time, it was not until little more than a half century ago that statistics relating thereto were so recorded, compiled and preserved as to be of much value in relation to any industry. Concerning the exports and imports of forest products the records, even for Boston, the largest port, are not available back of 1856. Many records there are of isolated years or brief series of years as to the production of forest products and trade in them, but they have little sequence and do not form the basis for any exact statements in regard to the Commonwealth as a whole.

In previous chapters have been reproduced many of these isolated records, which are invariably interesting and often instructive, but that which can be put into tabulated form in this chapter occupies but small space and covers a comparatively brief period. Before census returns in any satisfactory way took account of the industries, practically the entire area of Massachusetts had been cut over by the lumbermen, and for substantially a century the lumber product of the State has been from logs brought within its borders from New Hampshire and Vermont or, if of native timber, the second or third cuttings from land which had been the seat of logging operations for from 100 to 250 years.

In Volume I of this work, Chapter XXX is devoted to the statistics of lumber production in the United States. As there shown, the first census which reported a lumber product in Massachusetts was that of 1810. By that census, sawmills were reported from only two counties of Massachusetts and Maine combined. In these two counties were reported 150 sawmills having a product of 11,215,000 feet, valued at $87,335. This report was manifestly worthless as regarded the State as a whole, for sawmills were dotted over the entire area of Massachusetts, from east to west, and north to south, and all along the deeply indented coast line of Maine, reaching, even at that early date, up the tidal rivers to the head of navigation at such points as Bangor and Augusta.

The census of 1820 was but little more satisfactory in regard to the country at large, while it gave nothing at all as to the lumber industry of Massachusetts. A census of manufactures was not attempted in 1830, but in 1840 a comparatively successful effort was made to secure a report

as to the number of sawmills and the value of their product. According to that census, the number of sawmills in Massachusetts (Maine was separated from the parent State in 1820) was 1,252 and the value of their product $344,845. By the same census, the number of sawmills in Maine, was 1,381 and the value of their product $1,808,683. This marked difference in the value of the sawmill product of the two states, with only a slight difference in the number of establishments, would indicate that no later than 1840 the mills of Massachusetts were small affairs and cutting largely for their immediate local trade or doing custom work. The report of the census of 1840 does not give a sufficient clew as to the form of the schedules and the scope covered by them to determine with definiteness whether the value of the product included the value of the entire product or only that which was placed on the general market. The latter seems the plausible presumption.

Beginning with 1850, however, there has been a consecutive and businesslike policy used in obtaining census reports and as to certain principal factors of the industry, and, notwithstanding later censuses have introduced new items, the reports are easily comparable. The following table includes the principal items in regard to the lumber producing industry at each of the decennial periods beginning with 1850:

COMPARATIVE LUMBER STATISTICS, 1850-1900—MASSACHUSETTS.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments ...	448	611	644	606	488	553
Capital	$1,369,275	$1,419,473	$2,054,829	$2,480,340	$5,135,860	$6,253,171
Number of wage-earners	1,237	1,408	2,291	1,970	3,000	3,463
Wages	$396,576	$421,548	$569,300	$431,612	$1,042,508	$1,499,661
Cost of material used	$834,847	$1,570,362	$2,065,375	$1,904,105	$2,719,117	$3,034,828
Value of products.	$1,552,265	$2,353,153	$3,556,870	$3,120,184	$5,211,607	$6,526,230

[1] Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

It will be observed that, on the whole, there has been a steady growth in the capital employed, number of wage-earners, wages paid, cost of materials and the value of the products. A decline in most of these items between 1870 and 1880 is due to the conditions of the timber and lumber markets during that period. It was when the timber of Michigan, Wisconsin and adjacent states was being most rapidly developed and while yet its stumpage value was low. Following 1880, however, came a period of rapid advance in the value of standing timber, which led to a more careful scrutiny of timber in the older states, with the result that manufacture was stimulated in all the eastern states, particularly in New England.

The last decennial census, that of 1900, covering, where it dealt with reports of business establishments, the calendar year of 1899, was more complete than any that preceded it. From that census have been taken the figures embraced in the following table:

FOREST PRODUCTS OF MASSACHUSETTS—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
White pine	258,214,000	$2,695,876
Hemlock	12,234,000	144,910
Spruce	29,216,000	356,395
Cedar	175,000	1,975
All other conifers	72,000	5,750
Total, conifers	299,911,000	$3,204,906
HARDWOODS:		
Ash	120,000	$ 2,145
Birch	1,000,000	13,305
Chestnut	19,488,000	251,843
Basswood	300,000	2,995
Oak	16,091,000	294,151
Poplar	225,000	5,927
Black Walnut	45,000	1,875
Maple	2,397,000	82,780
Other hardwoods	2,481,000	108,398
Total, hardwoods	42,147,000	$763,419
Total, rough lumber	342,058,000	$3,968,325

SHINGLES.

	Quantity, pieces.	Value.
White pine	14,596,000	$33,174
Cedar	2,140,000	5,093
Hemlock	1,470,000	3,390
Spruce	1,984,000	4,422
Other conifers	150,000	300
All hardwoods	160,000	315
Total, shingles	20,500,000	$46,694

COOPERAGE MATERIALS.

	Quantity.	Value.
Hoops, pieces	180,000	$ 1,080
Staves, pieces	8,255,000	49,890
Headings, sets	398,000	11,015
Total, cooperage materials	.....	$61,985

OTHER SAWED PRODUCTS.

Bobbin and spool stock, feet b. m.	827,000	$ 14,640
Furniture stock, feet b. m.	753,000	10,250
Agricultural implement stock, feet b. m.	227,000	4,540
Carriage and wagon stock, feet b. m.	325,000	8,090
Lath, pieces	8,807,000	23,483
All other sawed products	.....	1,535,802
Total, other sawed products	.....	$1,596,805

TIMBER CAMP PRODUCTS.

Basket stock, cords	2	$ 20
Fence posts, pieces	52,450	5,358
Logs cut for export, feet b. m.	20,000	280
Logs cut for domestic sale, feet b. m.	6,883,000	52,660
Handle stock, cords	40	200
Hemlock bark, cords	188	724
Piles, pieces	1,080	2,065
Railway ties, pieces	149,479	54,474
Rived or shaved shingles, pieces	706,000	1,368
Ship knees, pieces	35	1,050
Telegraph poles, pieces	16,640	26,658
Wheel stock, cords	1	30
Charcoal, bushels	64,386	7,140
All other products	.....	30,387
Amount received for contract work	.....	42,925
Total, timber camp products	.....	$225,339
Total, planing mill products	$1,243,408	
Less value of lumber used	567,825	$675,583
Grand total, value forest products	.....	$6,574,731

The totals in the above table do not absolutely agree with those in the preceding table for the reason that the comparative table by censuses gives merely what is considered as the lumber industry proper, viz., sawmills, logging camps, and planing mills operated in connection with sawmills. The table giving the products for 1899, on the other hand, gives all forest products as far as they can be determined from the censuses, giving a grand total value of $6,574,731.

A later census than that of 1900 is the industrial census taken in 1905 and covering the calendar year of 1904. It is not readily comparable with the next preceding decennial census, because from its consideration were eliminated all custom mills. The census bureau, however, recast the twelfth census, eliminating therefrom, as far as possible, all mills that seemed to be custom mills, with the results that are given in the following table:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—MASSACHUSETTS.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	366	[1]296
Capital	$4,470,006	[1]$3,283,773
Salaried officials, clerks, etc:		
Number	95	[1]42
Salaries	$82,346	[1]$69,373
Wage-earners:		
Average number	3,548	[1]1,942
Wages	$1,502,524	[1]$961,368
Miscellaneous expenses	$456,928	$459,532
Cost of materials used[2]	$2,957,624	[1]$2,913,990
Value of products[2]	$6,277,729	$5,389,263
Quantity, Value and Principal Varieties of Rough Lumber:		
White pine:		
Thousand feet b.m.	229,161	154,749
Value	$2,383,603	$1,870,158
Hemlock:		
Thousand feet b.m.	9,080	18,900
Value	$108,145	$250,957
Spruce:		
Thousand feet b.m.	28,119	36,553
Value	$343,085	$590,177
Cedar:		
Thousand feet b.m.	175	5,113
Value	$1,975	$251,255
Birch:		
Thousand feet b.m.	885	1,963
Value	$11,600	$26,463
Ash:		
Thousand feet b.m.	100	2,281
Value	$1,900	$38,230
Chestnut:		
Thousand feet b.m.	17,408	13,693
Value	$225,645	$203,763
Oak:		
Thousand feet b.m.	14,727	9,545
Value	$272,520	$170,378
Maple:		
Thousand feet b.m.	2,169	4,126
Value	$79,895	$58,858
All other:		
Thousand feet b.m.	4,458	15,544
Value	$151,240	$1,359,855
Total quantity, thousand feet b.m.	306,282	262,467
Total value	$3,579,608	$4,820,094

[1]Decrease.

[2]Includes a duplication—the value of rough lumber, which in 1905 amounted to $435,549, remanufactured in planing mills connected with sawmills producing it.

As custom mills form an important part of the number of mills in Massachusetts, though of small capacity individually, the product is less for each item as embraced in the report of 1905 than by the twelfth census. Even on that basis, however, the report for the census of 1905 showed a decrease from the figures made on the same basis for 1900. It indicated, therefore, a decrease in the volume of business in five years, explainable on the ground that the extreme activity in the lumber business of New England, which culminated in 1900 or 1901, had drawn on the supply of standing timber to such an extent that the volume of production could no longer be maintained. Yet the inference drawn from the above comparative tables, as well as from the facts set forth in previous chapters, is unavoidably that, with a greater attention being paid to reafforestation and to the maintenance and renewal of present timber supplies, Massachusetts must continue to be in perpetuity a producer of the products of the forest, though, with its comparatively dense population and the considerable area devoted to agriculture, it will not be able to produce per square mile so large quantities as Maine, New Hampshire and Vermont.

EXPORTS AND IMPORTS.

While in the first stages of New England settlement the heaviest exports of timber were probably from Portsmouth and vicinity, as soon as the colonies became organized, as it were, so that the larger congeries of population could have their natural effect, Boston came to the front as the concentrating point of lumber commerce, which position it has held continuously until this time. Not only did it export on a large scale the products of New England, but it was the chief point for importation which, at an early date, was considerable, consisting chiefly of cabinet woods and cabinet wares.

As in other lines of commerce Massachusetts was for generations an exporter of raw materials and an importer of manufactured goods. Within the period covered by definite statistics, however, beginning with 1856, Massachusetts has been an importer of unmanufactured timber and lumber rather than an exporter, and its exports have been much heavier in manufactures of wood than in raw material.

The following table is a record, as obtained from the Government archives in Washington, of the imports of unmanufactured wood into the customs district of Charlestown and Boston, of which Boston is the port, for the fiscal years of 1856–1905, inclusive, except certain years for which there were no district returns. The first column, headed "Cabinet woods," contains all the varieties, which beginning with 1895 were separated. Starting with that year a separate record was made of mahogany importations. The chief item under the heading of "Sawed lumber" in the original record is "Boards, deals and planks," but in that column have been placed joists and scantling as well.

IMPORTS OF UNMANUFACTURED WOOD INTO BOSTON AND CHARLESTOWN, 1856-1905.

YEAR.	Cabinet woods, value.	Logs and hewn timber, value.	Sawed Lumber.		Shingles.		Other lumber, value.	All other unmanufactured, value.
			Quantity, feet.	Value.	Quantity, pieces.	Value.		
1856	$105,996	.....	.....	.....	.....	.....	.....	$ 4,302
1857	81,512	.....	.....	.....	.....	.....	.....	7,318
1858	55,417	.....	.....	.....	.....	.....	.....	.....
1859	77,672	.....	.....	.....	.....	.....	.....	.....
1860	81,171	.....	.....	.....	.....	.....	.....	.....
1861	32,328	.....	.....	.....	.....	.....	.....	.....
1862	14,077	.....	.....	.....	.....	.....	.....	.....
1863	41,143	.....	.....	.....	.....	.....	.....	.....
1864	104,998	.....	52,000	$ 1,340	.....	.....	.....	.....
1865	75,310	.....	.....	.....	.....	.....	.....	216
1868	43,103	$131,281	7,143,000	55,380	.....	.....	$ 4,072	45,924
1869	34,253	.....	.....	.....	.....	.....	.....	.....
1870	36,379	.....	.....	.....	.....	.....	.....	.....
1871	55,089	32,741	56,675,000	378,428	.....	$11,690	47,149	76,160
1872	120,861	25,155	47,886,000	307,319	4,337,000	9,024	42,151	65,647
1873	226,566	1,100	42,973,000	322,891	5,229,000	12,529	55,747	.....
1874	220,526	.....	25,589,000	191,256	681,000	1,511	42,104	.....
1875	191,320	.....	13,681,000	111,183	964,000	1,960	19,663	.....
1876	121,740	17	5,048,000	36,627	532,000	1,132	14,961	.....
1877	134,453	.....	5,407,000	32,717	143,000	148	12,326	.....
1878	156,649	17	2,013,000	12,986	77,000	131	11,741	.....
1879	131,568	.....	3,818,000	24,952	622,000	1,286	10,817	.....
1880	153,763	762	14,221,000	92,408	1,474,000	2,629	19,349	.....
1881	190,077	2,776	19,869,000	143,441	400,000	861	13,380	.....
1882	567,050	.....	17,865,000	129,703	140,000	443	15,029	.....
1883	499,535	.....	10,793,000	73,336	897,000	2,246	21,017	.....
1884	421,041	.....	11,318,000	84,978	109,000	244	19,303	6
1885	385,832	.....	15,571,000	114,163	35,000	81	26,905	5
1886	424,243	.....	14,337,000	107,598	384,000	760	23,059	.....
1887	303,712	.....	23,025,000	166,213	1,122,000	2,966	35,484	.....
1888	431,069	.....	24,809,000	192,034	635,000	1,392	40,644	16
1889	671,927	.....	18,646,000	139,902	8,978,000	16,710	42,120	.....
1890	483,059	.....	12,329,000	99,865	552,000	1,125	31,711	1,183
1891	979,752	316	24,554,000	202,055	907,000	1,829	33,621	1,327
1892	1,090,601	.....	20,596,000	167,730	4,268,000	9,492	58,544	319
1893	824,842	3,662	19,743,000	163,074	6,942,000	17,894	77,926	752
1894	496,513	2,427	17,123,000	133,712	5,260,000	11,723	83,521	199
1895	187,757	17,718	45,818,000	381,937	1,609,000	3,196	13,207	345,026
1896	103,207	29,632	68,401,000	629,729	.....	.....	.....	334,153
1897	162,161	40,347	55,148,000	499,721	.....	.....	7	480,378
1898	249,785	97,413	14,786,000	122,278	32,704,000	59,102	44,594	117,900
1899	502,726	49,278	13,803,000	114,668	18,842,000	36,109	32,520	213,565
1900	381,317	46,587	18,055,000	167,469	22,056,000	42,367	23,459	175,683
1901	543,364	33,902	15,652,000	136,809	13,652,000	24,421	37,102	315,593
1902	961,603	99,286	16,969,000	168,178	6,352,000	11,477	24,098	525,709
1903	826,060	38,857	11,089,000	108,472	5,800,000	11,837	16,995	296,812
1904	770,728	21,333	8,693,000	89,923	10,186,000	21,192	23,989	241,903
1905	603,843	23,778	16,277,000	166,178	6,784,000	13,794	18,282	324,005

Boston has been so important a factor in the mahogany business of the United States that it seems well to give the records of importations since 1895, the year in which mahogany was made a separate item. These importations are chiefly due to the operation of one mahogany importer and manufacturer. The table showing the quantity and value of annual imports is as follows:

IMPORTS OF MAHOGANY—BOSTON AND CHARLESTOWN.

YEAR.	Feet.	Value.	YEAR.	Feet.	Value.
1895	3,378,000	$144,882	1901	10,093,000	$455,868
1896	2,782,000	84,508	1902	18,798,000	835,028
1897	4,547,000	129,100	1903	17,146,000	737,522
1898	5,546,000	198,054	1904	15,272,000	693,294
1899	8,251,000	392,161	1905	10,037,000	540,263
1900	9,851,000	362,426			

IMPORTS OF MANUFACTURED WOOD.

From 1856 importations of manufactures of wood were separated by the customs house records into two classes, "Cabinet ware and household furniture" as one, and "All other manufactures" as the other. In 1871, however, all importations of these general classes were grouped with "Cabinet ware and household furniture," as that was probably the most important single item. During the two previous years all wood importations of every character except cabinet woods were included under the heading, "All other manufactures." This statement is necessary to explain the magnitude of those figures. From 1872 until 1883 all manufactures were included in cabinet ware, and from that time on the two classifications were kept distinct. In 1890 a new heading was introduced. The wood pulp business had grown to such a magnitude that it deserved the separate classification which at that time was given to it. The table is as follows:

IMPORTS OF MANUFACTURED WOOD INTO BOSTON AND CHARLESTOWN, 1856-1905.

Year.	Cabinet ware, value.	Wood pulp, value.	All other manufactures, value.	Year.	Cabinet ware, value.	Wood pulp, value.	All other manufactures, value.
1856	$ 588	.....	$ 8,974	1882	$91,013	.....	.....
1857	3,308	.....	4,938	1883	87,340	.....	.....
1858	1,464	.....	5,575	1884	38,877	.....	$ 62,520
1859	2,267	.....	3,598	1885	23,340	.....	51,490
1860	1,156	.....	5,041	1886	18,048	.....	30,995
1861	1,666	.....	6,946	1887	16,750	.....	45,599
1862	.....	.....	828	1888	23,005	.....	36,815
1863	2,126	.....	932	1889	30,188	.....	39,095
1864	8,397	.....	.....	1890	30,623	$291,627	37,689
1865	12,975	.....	376	1891	30,732	415,775	121,559
1868	32,511	.....	287	1892	43,155	385,016	109,009
1869	.....	.....	448,927	1893	43,529	811,980	121,069
1870	.....	.....	477,810	1894	17,990	487,912	101,107
1871	26,837	.....	.....	1895	27,735	265,944	181,641
1872	44,139	.....	.....	1896	18,583	333,881	189,064
1873	82,625	.....	.....	1897	32,970	193,962	140,447
1874	68,013	.....	.....	1898	34,053	123,147	72,946
1875	45,790	.....	.....	1899	30,239	142,148	112,810
1876	30,977	.....	.....	1900	41,961	375,382	87,353
1877	21,922	.....	.....	1901	39,652	185,031	142,287
1878	36,343	.....	.....	1902	59,504	214,809	136,639
1879	38,292	.....	.....	1903	68,271	352,871	148,053
1880	63,039	.....	.....	1904	35,579	601,857	144,963
1881	71,469	.....	.....	1905	47,017	830,331	133,820

The importations of wood pulp show surprising variations, due to various causes which sometimes work together and sometimes balance each other. Market prices, domestic supply, favorable or unfavorable logging conditions during the winters, all affect the importation; while the attitude of the Canadian provincial governments toward the exportation of wood cut from Crown lands has at times had pronounced influence upon the volume of importations recorded in the various customs house districts of the United States.

EXPORTS OF FOREST PRODUCTS.

The following table, showing exports of unmanufactured wood from Boston and Charlestown for 1856–1905, inclusive, is a record which, on the whole, shows a decline within recent years of the export trade at Boston, though there is no uniformity of increase or decrease either in the aggregate or in any one item:

EXPORTS OF UNMANUFACTURED WOOD FROM BOSTON AND CHARLESTOWN, 1856-1905

Year.	Logs.	Sawed lumber.		Shingles.		Shooks.	Staves and headings.	All other unmanufactured.
	Value.	Quantity, feet.	Value.	Quantity, pieces.	Value.	Value.	Value.	Value.
1856	.....	11,766,000	$ 226,964	3,275,000	$11,880	.....	$ 71,526	$ 248,929
1857	.....	13,743,000	264,433	3,213,000	10,807	.....	27,372	69,919
1858	.....	21,772,000	368,597	4,475,000	14,019	.....	5,140	31,497
1859	.....	20,390,000	390,170	6,015,000	16,840	.....	12,390	40,620
1860	.....	22,461,000	432,630	3,184,000	8,860	.....	16,800	13,250
1861	.....	16,424,000	312,823	3,859,000	11,522	.....	55,184	66,162
1862	.....	20,109,000	350,032	5,651,000	16,458	.....	83,083	148,224
1863	.....	26,305,000	551,865	11,943,000	40,760	.....	201,422	7,960
1864	.....	25,374,000	631,096	10,162,000	40,783	$ 316,575	26,045	65,079
1865	.....	26,398,000	954,872	10,611,000	46,857	358,593	57,461	137,360
1866	.....	.....	.....	.....	.....	.....	.....	.....
1867	.....	14,659,000	465,431	7,553,000	33,630	395,531	199,596	27,170
1868	.....	15,877,000	468,443	6,870,000	27,992	371,619	157,848	22,085
1869	$50,979	13,322,000	423,589	5,606,000	19,102	480,234	.....	14,035
1870	57,214	6,203,000	194,757	5,728,000	20,367	377,811	.....	9,481
1871	19,915	6,288,000	167,454	2,297,000	8,583	391,759	.....	44,147
1872	13,143	5,946,000	180,438	2,992,000	10,016	338,498	.....	34,774
1873	18,728	8,153,000	289,603	4,017,000	14,427	586,744	.....	31,668
1874	15,492	6,708,000	196,168	3,920,000	11,922	589,820	.....	41,842
1875	11,642	8,704,000	264,737	4,172,000	13,077	438,012	.....	45,833
1876	14,421	9,765,000	247,180	4,115,000	10,861	306,017	.....	17,322
1877	10,490	9,211,000	233,645	3,185,000	7,665	324,730	.....	21,116
1878	11,073	9,464,000	222,918	4,069,000	9,566	269,894	.....	20,726
1879	14,412	10,529,000	213,000	3,964,000	8,546	252,755	.....	18,713
1880	31,825	13,997,000	291,113	3,899,000	8,804	219,979	.....	21,164
1881	16,422	15,180,000	341,743	4,370,000	9,228	232,150	.....	16,035
1882	16,634	13,999,000	423,799	2,562,000	6,463	343,461	.....	17,245
1883	29,300	13,570,000	422,153	3,039,000	8,193	376,292	.....	36,038
1884	31,273	13,505,000	387,302	2,240 000	5,453	170,003	149,683	77,294
1885	16,732	12,157,000	341,275	2,477,000	5,767	125,659	151,938	70,681
1886	29,586	11,470,000	327,445	2,129,000	5,700	94,105	152,115	73,758
1887	11,290	9,783,000	291,771	1,724,000	4,565	109,334	138,998	87,125
1888	8,663	9,926,000	312,315	1,760,000	3,963	64,988	123,822	81,289
1889	.....	20,536,000	663,956	2,204,000	4,748	52,489	185,029	3,529
1890	1,800	19,000,000	580,989	2,728,000	5,148	61,259	142,296	2,951
1891	17,255	11,152,000	362,469	1,208,000	2,725	66,693	138,746	5,668
1892	27,021	5,014,000	107,623	421,000	775	42,166	201,195	147,510
1893	39,148	3,410,000	75,302	638,000	1,053	10,951	203,682	328,881
1894	59,238	4,781,000	115,609	714,000	1,514	35,551	156,445	330,858
1895	40,607	7,545,000	171,920	1,920,000	3,245	15,631	116,473	365,718
1896	35,983	5,568,000	128,375	790,000	1,253	13,880	90,350	481,832
1897	33,485	4,720,000	108,673	393,000	692	2,034	79,114	535,648
1898	62,104	4,489,000	105,445	882,000	1,552	9,107	43,498	678,195
1899	29,440	4,160,000	94,757	360,000	949	9,674	30,025	770,415
1900	16,711	3,057,000	101,674	175,000	364	12,620	60,899	672,017
1901	26,877	3,214,000	103,996	408,000	787	35,018	75,292	758,537
1902	24,324	4,468,000	120,820	343,000	956	23,860	44,935	479,017
1903	5,784	6,123,000	182,241	163,000	340	33,790	67,272	475,923
1904	2,697	11,561,000	428,466	156,000	382	28,466	38,020	505,184
1905	3,120	13,932,000	525,442	366,000	1,133	23,853	18,070	242,549

It is a matter justifying some surprise, in view of the heavy decline during the last decade in the product of white pine, that the exportation of rough lumber should have been so well maintained. The explanation is found in the increased exportation of the hardwoods.

EXPORTS OF MANUFACTURES OF WOOD.

As a center of an important manufacturing district, Boston has always

been an exporter of forest products in manufactured form. In colonial days it was the leader in this business, but though it has now dropped behind from a comparative standpoint, its exports of this class are still of importance. The record for fifty years is as follows:

EXPORTS OF MANUFACTURES OF WOOD FROM BOSTON, 1856-1905.

YEAR.	Doors, sash and blinds, value.	Furniture, value.	Hogsheads and barrels, value.	Trimmings and mouldings, value.	Woodenware, value.	All other manufactures, value.
1856	.....	$273,796	.....	.....	.....	[1]$410,404
1857	.....	327,539	.....	.....	.....	[1]606,872
1858	.....	328,654	.....	.....	.....	[1]584,685
1859	.....	360,560	.....	.....	.....	[1]601,150
1860	.....	304,560	.....	.....	.....	[1]530,650
1861	.....	243,814	.....	.....	.....	[1]466,569
1862	.....	289,450	.....	.....	.....	[1]512,173
1863	.....	405,188	.....	.....	.....	[1]541,271
1864	$ 32,898	402,519	$25,942	.....	$ 79,350	163,392
1865	42,672	617,130	21,504	.....	124,434	267,555
1866	.....	.....	.....	.....	.....	.....
1867	.....	390,341	24,951	.....	.....	380,209
1868	.....	399,425	55,830	.....	.....	364,167
1869	.....	452,561	.....	.....	184,677	245,907
1870	.....	448,720	29,720	.....	91,497	211,528
1871	.....	301,569	22,736	.....	77,418	146,914
1872	.....	330,510	33,207	.....	96,711	195,566
1873	.....	377,865	25,098	.....	139,640	211,894
1874	.....	461,678	34,886	.....	96,123	250,495
1875	.....	401,033	39,690	.....	107,403	182,486
1876	.....	323,294	34,726	.....	80,414	182,703
1877	.....	337,005	28,935	.....	99,002	189,505
1878	.....	361,202	22,073	.....	58,478	213,987
1879	.....	251,639	27,918	.....	33,717	209,033
1880	.....	266,996	30,192	.....	57,129	241,049
1881	.....	291,077	23,059	.....	96,342	281,454
1882	.....	399,092	33,871	.....	114,057	324,605
1883	.....	354,909	28,991	.....	45,010	316,472
1884	36,252	294,093	44,235	$11,004	35,107	247,016
1885	21,392	287,308	48,910	4,010	31,944	202,481
1886	22,375	200,836	76,511	3,208	37,589	185,218
1887	12,387	126,196	45,333	8,788	48,474	147,603
1888	9,685	154,135	64,321	1,716	53,874	199,128
1889	.....	108,575	.....	5,359	27,989	659,358
1890	5,849	94,940	60	25,037	57,094	370,142
1891	261	122,329	75	2,069	56,347	236,138
1892	5,078	147,301	70,531	1,665	42,741	121,097
1893	12,730	193,271	17,547	1,064	57,063	76,865
1894	4,515	196,356	39,251	1,891	35,497	72,618
1895	3,582	189,476	20,714	1,990	54,640	83,764
1896	1,614	248,857	27,001	3,202	58,483	129,391
1897	43,999	251,437	10,286	2,092	62,021	293,127
1898	144,486	345,049	7,885	22,411	68,422	276,687
1899	339,747	475,834	20,927	31,429	83,275	290,386
1900	279,347	410,351	4,378	25,516	149,208	369,453
1901	156,329	387,394	11,263	8,497	136,827	501,717
1902	118,808	397,870	3,714	2,704	169,613	480,905
1903	120,682	382,048	12,082	23,415	136,933	531,542
1904	67,218	401,434	2,846	26,657	102,645	455,779
1905	5,574	298,812	6,205	26,731	89,491	574,561

[1]Includes all manufactures except furniture.

The original table from which the above was compiled gave the exportations of wood pulp from 1898 on, as previous to that time they had been included in all other manufactures. The business had reached such a magnitude that we give herewith the exportations of this commodity during the brief period in which the separate records have been made. These values are, however, contained in those of the previous table under the heading, "All other manufactures."

EXPORTS OF WOOD PULP FROM BOSTON.

Year.	Quantity, lbs.	Value.	Year.	Quantity, lbs.	Value.
1898	7,112,443	$ 90,101	1902	10,531,594	$208,353
1899	5,551,248	95,935	1903	5,778,399	111,550
1900	8,357,252	129,639	1904	4,818,341	93,156
1901	17,298,978	286,094	1905	4,089,569	86,711

The minor ports of Massachusetts are minor indeed as compared with Boston, and the importations and exportations of wood and wood products have been so small during the last fifty years that they are hardly worth the space necessary to give a complete record. The following table contains the totals for fifty years, under the headings selected, for each of the minor ports:

MINOR PORTS OF MASSACHUSETTS—1856–1905.

Name of District.	Wood imports, value.				Wood exports, value.			
	Unmanufactured.		Manufactured.		Unmanufactured.		Manufactured.	
	Sawed lumber.	All other unmanufactured.	Cabinet wares and furniture.	All other manufactures.	Sawed lumber.	All other unmanufactured.	Cabinet wares and furniture.	All other manufactures.
Barnstable	$ 18,182	$ 40,331	.....	$ 2,868	$ 608	.....	$ 28	$ 225
Edgartown	2,693	3,700	$ 60	19	2,588	$ 2,913	.....	160
Fall River	285,333	225,767	857	17,060	48	24,351	.....	9,730
Gloucester	81,250	243,691	4,100	25,010	17,684	5,137	2,424	61,362
Marblehead	395,093	102,685	109	10,493	5,223	.....	792	9
Nantucket	439	10	.....	.....	.....	.....	.....	.....
New Bedford	238,975	163,128	3,463	8,025	200,695	112,413	30,958	61,272
Newburyport	12,733	15,832	240	9,740	96,420	14,803	5,378	13,725
Plymouth	32,394	49,949	.....	613	.....	.....	.....	96
Salem and Beverly	252,257	176,246	41	31,030	58,814	49,121	64,117	61,348
Springfield	.....	2,287	1,559	10,247	.....	.....	.....	.....

Some of these ports in early days were of importance, particularly in colonial times. Plymouth was undoubtedly the first exporter of timber from what is now Massachusetts. Newburyport, located near the mouth of the Merrimac, once an important logging stream, was, a hundred years ago, of importance in the lumber trade. None of them within the last fifty years has more than incidentally dealt in lumber and timber. In some of these instances long periods of years went by without an entry being made.

All of Barnstable's exports of lumber were made from 1889 to 1895, but there were occasional importations during the entire fifty year period. Egdartown, which is the port of Marthas Vineyard, had no exportations whatsoever from 1866 to 1899. Fall River has been an importer of lumber in a small way for years, the amounts running in some years to 5,000,000 feet of boards, deals and planks, but its exportations have been almost nil. Gloucester has received small quantities of lumber, presumably in vessel loads from the Maritime Provinces of Canada, which, doubtless,

are the source of nearly all the importations of the minor ports. Marblehead has been an importer of lumber steadily, but the year of largest volume was 1896, when it amounted to 6,224,000 feet, valued at $55,975. Its exports, as will be seen by the table, have been practically nil. Nantucket is not represented at all in the exports of lumber. New Bedford in only eight years within the last fifty has received more than 1,000,000 feet, the largest importation in any one year being 3,875,000 feet in 1896. Its exportations have been steady but small, never amounting to 1,000,000 feet in a year. Newburyport exported lumber in small quantities up to 1878, since which time it has been represented in but four years. Plymouth has imported small quantities of lumber and shingles within the last ten years, but has had no exportations whatsoever since 1878. Salem has been a steady importer since 1870, the largest amount in any one year being 4,033,000 feet in 1896.

SHIPBUILDING AND COMMERCE.

Commerce and shipbuilding in the New England colonies developed together. An early record states that in 1623 a ship of 140 tons, called the *Anne*, Mr. William Piece, master, was freighted at Plymouth and returned to England with a cargo consisting of clapboards with a few beaver skins and other furs. These "clapboards" were oak staves for wine casks and had a good sale in London. This was the beginning of a business which soon increased so as to become of importance to the colonies. Not only was lumber largely shipped to England, but the settlers of the West India islands depended upon New England for their supply of barrels and boxes in which to export their production of molasses and sugar. The Puritans soon found that Spain and Spanish America furnished the best markets for pipe staves, and they shipped practically all material of that class to those countries.

In 1624, four years after the first landing, the Plymouth Colony received an accession in a carpenter and salt-maker sent out by the company. Of the carpenter Governor Bradford says: "He quickly builds two very good and strong shallops, with a great and strong lighter, and had hewn timber for Keches (a much larger description of vessel), but this spoilt; for in the heat of the season, he falls into a fever and dies, to our great loss and sorrow."

At Monamet, now Sandwich, near Cape Cod, to which point settlers removed about that time, a pinnace was built by the Plymouth people in 1627 as a fishing craft, but the first vessel of any size constructed there was a bark built by subscription in 1641. She was about fifty tons burden and was estimated to cost £200.

Shipbuilding was instituted in Boston in the first year of its history. In the records of the Governor and Company of Massachusetts Bay it is

stated that April 17, 1629, they had "six ship-wrights, of whom Robert Molton is chief." The same year saw ships on the ways and trade began the next year with Virginia and other colonies. July 4, 1631, Governor John Winthrop launched at Mystic, now Medford, a vessel of sixty tons, which he called the *Blessing of the Bay*. This was the first vessel built in Massachusetts Colony, Plymouth being then settled, and it signalized the beginning of what was to be an important industry. It was a practical demonstration of the excellent quality of New England timber for this purpose. In the course of the season this vessel made several coasting trips, and soon after visited Manhattan and Long Island. Another vessel of sixty tons, called the *Rebecca*, was built in 1633 at Medford. A ship of 120 tons was built at Marblehead by the people of Salem in 1636. Governor Winthrop in his journal speaks of the building of a ship at Salem of 300 tons and another at Boston of 150 tons. The latter was probably the *Trial*, the first ship built at Boston proper. She sailed for Bilboa June 4, 1642. Five other vessels, all of considerable size, were built in 1642 at Boston, Plymouth, Dorchester and Salem, and in 1644 two, of 250 and 200 tons respectively, were built at Cambridge and Boston, which sailed for the Canaries with pipe staves, fish, etc. A ship of 300 tons was built at Boston in 1646.

Hubbard, speaking of the period of 1646–51, says: "The people of New England at this time began to flourish much in building ships and trafficking abroad, and had prospered very well in these affairs." Captain Edward Johnson, who published in 1654 his narrative entitled, "Wonder Working Providence of Sion's Saviour in New England," reference to which has previously been made, said concerning Boston: "Good store of Shipping is here yearly built, and some very faire ones; both Tar and Mastes the countrey affords from its own soile; also store for Victuall both for their own and Forreiners—ships, who resort hither for that end; this Town is the very Mart of the Land. French, Portugalls and Dutch come hither for Traffique." An account of New England, written about 1676, says: "They built every year about Boston, Salem, and in that jurisdiction, twelve ships between forty and eighty tons."

As an evidence of the energy with which this business was prosecuted in Massachusetts from the earliest period, it is mentioned that upon the North River, crooked, narrow and shallow at low water, ships were built of the size of 300 and 400 tons throughout its whole course. Scituate, at its mouth, was long noted for its shipbuilding, which was begun there as early as 1698. In 1772 ninety vessels were built there, but in 1788 only three. New Bedford was famous for shipbuilding long before the Revolution, and though it suffered damage in 1778 to nearly £100,000, it early recovered its standing. The villages of Westport, Rochester, Wareham and Dart-

mouth, in its immediate vicinity, were little more than shipyards. Newburyport was early celebrated for the excellence of the ships constructed there, as well as for the magnitude of its commerce, and Salisbury, a few miles from Newburyport, was in early days a principal shipbuilding station, continuing so until the Revolution. Salem was long an important shipbuilding point, and that town, together with Boston, owned in 1735 about 25,000 tons of shipping. At that time and long thereafter Salem was second only to Boston in commercial enterprise. For several years previous to 1721 it cleared yearly about eighty vessels in the foreign trade, and in 1748 about one hundred and thirty. It was estimated at the beginning of the War of the Revolution that 398,000 tons of colonial built shipping were employed in the general commerce of Great Britain.

Boston's preëminence in shipbuilding came largely after the Revolutionary War. At Hartt's yard in the North End, the frigate *Constitution*, whose achievements the poem "Old Ironsides" celebrated, was built between the years 1794 and 1797. That water front was then lined with shipyards. At the time of the passage of the Embargo Act in 1807, Boston owned one-third of the shipping of the entire United States and suffered most severely by that piece of legislation. East Boston became famous as a point of shipbuilding between 1840 and 1860. Between 1848 and 1858 the number of vessels built on the island was 170, ninety-nine of them exceeding 1,000 tons and nine of them being twice that tonnage. It was there in 1853 that the largest sailing vessel of its time, the *Great Republic*, was built. It had three decks and four masts and was not only the largest ship under sail, but developed into one of the fastest.

The above is, in brief, an outline, drawn from many sources, of the wooden shipbuilding period of Massachusetts. Wooden ships still are built, but since the Civil War the relation of the timber industry to vessel construction has been increasingly confined to the supply of decking and finish rather than, as of old, to all that entered into a ship from keel to top mast.

CHAPTER XVIII.

CONNECTICUT.

Both the Dutch of New Amsterdam and the English of New Plymouth claimed to be the discoverers of the territory which now comprises the Commonwealth of Connecticut; but the Dutch were, undoubtedly, the first to visit this portion of the continent, although they did not erect their trading post where Hartford now stands until the year 1633.

James I, in 1620, granted a general patent of New England, which embraced Connecticut. History has it that the Plymouth Company, or the Council for New England, conveyed the Connecticut region to the Earl of Warwick in 1630 and that the same year it was confirmed to him by a patent from Charles I. The year following (1631) the Earl in turn executed a patent for this section to Lord Say and Seal, Lord Brooke, Sir Richard Saltonstall and others. The conveyance covered, in a vague way, territory stretching from Narragansett Bay westward to the Pacific Ocean. Governor Winslow, of the Plymouth Colony, in 1631 named himself the discoverer of the river and valley of the Connecticut, and it was decided to make a settlement at Windsor.

Thus it will be seen there were two rival claimants to the same territory —the Dutch as discoverers and the English as patentees. Both effected settlements in 1633, but a few years later the Dutch sold their rights to the English.

In 1637 the towns of Hartford, Windsor and Wethersfield entered into articles of association, and a government was organized. The New Haven Colony was first established in 1638, and the year following a government was organized. The constitution adopted by the people of Connecticut at this time (1639) is recognized as the earliest example in history of a written constitution organizing a complete form of civil government.

In 1662 Charles II granted a charter which made Connecticut self-governing and more free and independent than any other of the colonies. This was followed by a union of the two colonies mentioned above—Hartford, Windsor and Wethersfield, and New Haven. In 1701 the cities of Hartford and New Haven became the joint capital of Connecticut. This state of affairs remained until 1873, when Hartford became the sole capital.

In 1687 Sir Edward Andros, following out the plans of James II, who endeavored to abrogate the charters of all the colonies, suspended the charter government of Connecticut, but it was restored, after the Revolu-

tion in England, in 1688. This form of government fulfilled all administrative requirements until 1818, when it was amended, the dominance of church influence and other defects being eliminated. This constitution remained unchanged until January, 1902, when it was altered further.

THE EARLY FORESTS.

Connecticut originally was forest clad with a mixed growth of trees, nearly all of which were long ago cut away, and today the State contains none of its original forest and little that is of much value for the manufacture of lumber. The woodlands of the State now have an area of 1,900 square miles, or 39 percent of the total area, according to the census of 1900.

In the early part of the Seventeenth Century settlers in Connecticut found a country completely covered with forest growth, except such clearings as had been made by the Indians for the purpose of tillage, by the simple method of setting fire to the dry grass and leaves and permitting the flames to run through the forest. According to Smucker's "Blue Laws of Connecticut," in 1635 "the inhabited portions of Massachusetts were divided from Connecticut by a wilderness of primeval forests." Almost the entire State abounded with oak, chestnut, pine, walnut, cedar, wild cherry, maple, ash, elm, beech, hazel, sassafras, sumach and other growths. The oak included the white, the red and the black, the white being declared in every way the equal in toughness and hardness of fiber of the famous English oak. There was not a tree indigenous to England which the English settlers did not find reproduced in utility, if not in exact species, in Connecticut.

The forests were of large growth, showing in their mighty trunks the marks of centuries.

DISTRIBUTION OF SPECIES.

As late as 1819 there were still noble forests of merchantable timber in Connecticut. Pease and Niles in their "Gazetteer of Connecticut and Rhode Island," published in 1819, gave the distribution of the different species by townships. While the phraseology has not been retained wholly, the facts have been carefully preserved in the five succeeding paragraphs.

In Milford, New Haven County, the forests were considered valuable, from their vicinity to navigable waters, and consisted of walnut, oak and chestnut. Oxford, in the same county, also was well covered with forests, the timber comprising oak, walnut and chestnut. At that time (1819) there were considerable quantities of wood and timber sent to market, most of it going to New Haven and New York. There were considerable forests at Woodbridge, New Haven County, and large quantities of wood were annually gotten out and shipped to market at New Haven. This timber, being of mountain growth, was of excellent quality and consisted of oak of various kinds, walnut, maple, etc.

The natural growth in the township of Norwich, New London County, was made up of oak, walnut, chestnut, and other deciduous trees.

In Fairfield, Fairfield County, "the original growth of timber was, at an early period, from a common but lamentable improvidence, principally destroyed; so that the forests now existing are of recent growth and comprise little timber fit for building. Wood and timber are valuable in this town, and command a high price. It is observed that the texture of the present growth of timber is firmer than that which was found at the first settlement; and that the timber growing upon the Sound is less porous and tougher than that which grows in the interior." There were extensive forests in the town of Weston, Fairfield County, consisting of different species of oak, of hickory, maple, bass, whitewood, chestnut, butternut, etc., containing much valuable timber. The natural growth of timber in Wilton, in the same county, was similar to other towns in the county, the forests being made up principally of deciduous trees.

In Windham, Windham County, the forests were not extensive in 1819, but there was timber sufficient for fuel and to supply the local demand for building purposes. Hickory, chestnut, and the different kinds of oak predominated. Canterbury's natural growth was of the same kind as Windham's. The forests of Columbia consisted of oak, chestnut and other deciduous trees. The town of Killingly was covered with magnificent forests which were largely of recent growth; the trees were of the deciduous species. The natural growth of timber in Mansfield was oak, walnut, chestnut, elm, ash, maple, etc. While the forests in Thompson were not extensive, they were of sufficient size to supply fuel and timber for local uses.

Litchfield, Litchfield County, was well supplied with forests with a wide range of trees, some of them being sugar maple, beech, buttonwood, oak, birch, chestnut, butternut, walnut, elm, pepperidge, wild cherry, bass, hornbeam, sassafras, etc. The mountains and hills in Barkhamsted were formerly heavily covered with excellent timber, a considerable portion of which was destroyed by the elements of wind and fire and by the ax at a time when timber was considered of little or no value. This forest growth was made up of oak, chestnut, sugar maple, beech, pine and hemlock. The natural growth of Bethlehem consisted of oak, maple, chestnut, walnut, etc. In Canaan the forests were much diversified, although they were principally deciduous. In these forests were found oak, chestnut, walnut, butternut, beech, sugar maple, soft maple, birch, hemlock, white pine, yellow pine, white cedar, red cedar, spruce, white, red and black ashes, elm, bass, boxwood, whitewood, pepperidge, mountain ash, sassafras, alder, etc. In Cornwall abounded the oak, chestnut, maple and pine; there was also some birch, ash, beech, etc., comprising every kind

of wood valuable for fuel, fencing and building. The sugar maple prevailed in Goshen and the maple sugar industry was at that time (1819) of considerable importance. In New Hartford the forests consisted generally of deciduous trees, except in the northern part of the town where the evergreen region of Connecticut commences. Here, but a few years before that time was an extensive tract of forests called "Green woods," but in 1819 they were greatly reduced; roads had been opened through them and considerable portions were cleared. There were not many forests in the township of Hartford, but the natural growth of trees were oak of various species, walnut, hickory, elm, ash, maple, buttonwood, willow, hornbeam, sassafras, thorn, locust, butternut, birch, wild cherry, bass, alder, etc.

In the same year that Pease and Niles completed their work, David D. Field wrote the "Statistical Account of Middlesex County," from which excerpts will be found of interest, as showing the forest growth of this county at that time:

Middlesex was made a county by an act of the Legislature of Connecticut, passed at their session in May, 1785, and then consisted of six towns, viz.: Middletown, Chatham, Haddam and East Haddam, which were taken from the county of Hartford; Saybrook and Killingworth, taken from the county of New London. Durham was annexed to Middlesex in May, 1799, from the county of New Haven.

Middlesex was originally well timbered, but the trees varied in kind as well as in size according to variations of soil and situation. On high grounds were the several species of oak, walnut and chestnut and in the low grounds were birch, maple, beech, elm, ash, and hemlock, thinly interspersed among which were buttonwood, butternut, poplar, dog or box wood, whitewood, basswood, locust, pepperidge, sassafras, horn, or hard beam, wild cherry, willow and alder. Pitch pine is said to have grown on the plain in Middletown Upper Houses. It was thick on a hill in the west part of Haddam, where the early inhabitants used to go and get pine knots as a substitute for candles, from which fact the neighborhood about it is called Candlewood Hill. White pine used to grow in a swamp in Millington, and trees of this kind are occasionally found in other parts of the country. A swamp in Saybrook and another in Killingworth are called cedar swamps from the prevalence of cedar among their wood. The red shrub cedar is common all over the county.

Considerable changes have taken place in the proportionate quantity of particular trees since the county was settled. Such as were of little value have been designedly destroyed by the cultivator. Such as were peculiar to grounds suitable for mowing and cultivation have been destroyed to prepare the way for grass and crops. Some trees from their brittleness or the slowness of their growth have been destroyed by sheep and cattle, while others, as the hemlock, beech and hard maple, rarely sprout from the roots, and if they do, are very liable to die. On these accounts some trees are less frequent in the county than formerly. The chestnut, smooth walnut and white oak sprout abundantly from the roots, as well as come up from seed, and grow on high and rough grounds, as well as on those which are suitable for tillage. Hence, there is a happy increase of these valuable trees over others in the county.

Large and numerous tracts are reserved in Middlesex for forests. It is, however, an alarming fact that wood and timber are decreasing. They are cut down not only to supply our own inhabitants with fuel and fencing and with materials for building

houses and vessels, but immense quantities of wood and lumber are exported to New York and other parts of our country, the call for which has been increasing since the Revolutionary War. Much more economy, however, is used with respect to wood than formerly. The practice of burning over woodlands for the sake of pasture has ceased, the growth of young trees is more cautiously guarded, more care is taken to make houses tight and to render a less quantity of fuel needful to warm them, fireplaces are improved and stoves in many cases introduced.

The price of timber in the county for houses is four cents per foot; chestnut timber for shipbuilding is $4 per ton, and oak $5; short oak plank for shipbuilding is $25 per thousand; long plank, from $35 to $40. Hickory wood in Middlesex of late years has varied from $5 to $6.50 per cord. Oak wood has varied from $3 to $4 per cord; in Middletown city it has sold for more. As all our towns, except Durham, border on Connecticut River or the Sound, our wood is generally within a few miles of navigable water. This is the only article used for fuel among us.

AN EARLY TIMBER LAND PURCHASE.

The first big timber deal of record was made in 1653 when John Winthrop, of New London (afterward Governor of the Colony of Connecticut), secured a large tract of timber land from its Indian proprietors. The wording of the deed is as follows:

Know all men by these presents, that I, James, sachem of Quinebaug, in consideration of the great friendship formerly from Mr. Winthrop, sometime governor of Massachusetts, and desirous of the continuance of same with his son, now residing at Pequot. And considering that he hath erected a saw mill at Pequot, a work very useful to the English and the Indians; for the supplying whereof, on consideration, I have swamps of timber very convenient, and for divers good reasons and considerations, me thereunto move—I the said James, do of mine own free and voluntary will and motion, give, grant, bargain and sell to Mr John Winthrop, of Pequot, all my land at Pautuxett, [the general name for all Falls, here referring to those at Acquiunk] upon the river that runneth from Quinebaug and runneth down towards Mohigan and towards the plantation of Pequot unto the sea; the bounds thereof to be from the present plot of the Indians planting ground at Quinebaug, where James, his fort is, on a hill at the said Pautuxett, and so down towards Shautuxkett so farr as the right of the said James doth reach or any of his men; so farr on both sides the river as ye right of ye said James doth [reach] or any of his men, with all the swamps of cedar, pine, spruce or any other timber and wood whatever together with them to the said John Winthrop and his heirs.

Witnesses { Richard Smith
Samuel Smith
T. B., mark of Thomas Bayley

Nov. 2, 1653.

Know all men by these presents, that I, Massashowitt, brother of James, doo, upon the consideration mentioned on the other side of this paper by my brother, doo likewise for myself give, grant, bargain and sell and by these presents confirm unto the said John Winthrop of Pequot, all that land at Pautuxett, as is on the other side of the paper and in that deed made over by my brother James to the said John Winthrop . . . and we the said James and Massashowitt do hereby testify that this we do by the full and free consent of Aguntus Pumquanon, Massitiarno, brother of Aguntus, also Moas and all the rest of the chief men of these parts about and at Quinebaug, and in their

name having all consent thereto. In witness whereof we have hereunto sett—this 25th of November 1653.

John Gallop, James Avery } Witnesses

ꝛ& The mark of James.
OG The mark of Massashowitt.

ꝑ Mark of William Weloma
T. B., Mark of Thomas Bayley.

THE SAWMILL FOLLOWED THE SETTLER.

Sawmills were so necessary an adjunct to the early settlements, yet the employment for them so limited by the sparse populations, that the towns were forced to make grants of peculiar or exclusive privileges and donations of land to persons willing to risk the expense of erecting them. Many of these early monopolies, granted by towns and larger municipalities, contained curious stipulations.

For example, Bishop in his "A History of American Manufactures," published in 1868, said:

In Connecticut the younger Winthrop, afterward Governor of Connecticut, had a sawmill at New London, previous to 1654, in which year the General Court granted Mr. Will Goodwin liberty to make use of the timber of waste lands, to keep his sawmill in employment. In the year 1661[1] a record of the Court states, that, "Liberty is granted Mr. Winthrop to find a place to set up a Saw-mill where it may not prejudice the farms or plantations already give out." His son, Fitz-John Winthrop, built another on the Nahantick, near Long Cove, in 1691, and two years after another was erected upon the same river by John Prentis. Others were built upon that river and adjacent streams, by leave of the Colony, in 1713 and 1721, the former by Colonel John Livingston, the other by Samuel Weller & Son. One of the earliest millwrights in eastern Connecticut was John Elderkin, one of the grantees of New London, in 1650–1. He was invited thither by Mr. Winthrop, from Massachusetts, where he had previously carried on that business, as well as that of house-carpenter and shipwright. . . . For a period of thirty-five years he was a general contractor for building mills, bridges, meeting houses, etc., in New London, Norwich and the adjoining settlements. . . .

In 1667, the Court granted Thomas Harris liberty to build a sawmill on the brook between Hartford and Wethersfield, on the east side of the "Great River," provided it be accomplished within two years, and he is allowed forty acres for his encouragement thereof. In 1671, John Allyn received a grant of one hundred acres of land, with the use of the timber on the Commons, and the stream for a like purpose.

In July 1680, the town of Norwich at the head of navigation on the Thames, granted Captain Fitch two hundred acres of land for his encouragement to set up a sawmill, and to have the benefit of the stream and timber at the place, and no others to set up a sawmill upon the said stream to his damage.

The first sawmill at Suffield was built near the mouth of Stony River in 1673, the dam having been built in 1672. The mill was burned in 1675 and rebuilt in 1677. The following is the grant to Major John Pynchon for the first sawmill, as quoted in Sheldon's "Documentary History of Suffield:"

[1] "Colonial Records of Connecticut" show this concession to have been granted September 8, 1653.

Granted to Mr. Pynchon the Privilidge of Stony River, and the streams belonging to it for the advantage of building a Saw Mill & Liberty to set it at any time where he shall Judge most meet and convenient for him, he being to have the whole use and privilidge of the streem or streems for that purpose, and for a Corn-Mill, if he shall set up one, & also the free use of what timber may be Needful for Board Planks, or the like which is growing on the Land, Intended for Lots, which he may fetch for that purpose out of such Land till Persons that take up their Lots come to make use of them: or that the Commtee see reason to Restrain his further taking Timber out of them for the Saw-Mill: When yet notwithstanding any Timber he may freely take out the Commons for Boards or any such like uses, the use of the Timber for sawing be allowd to the Mill out of the Commons according to former Grant without any restraint Whatsoever.

COST OF A SEVENTEENTH CENTURY SAWMILL.

The following quaint extracts are from Major Pynchon's account book, and will shed some light on early sawmill operations. They are from the authority quoted above.

1672. The charge and cost of my sawmill at Stony River.

	£	s.	d.
Imprs: viewing and searching for a place, also by hiring Jo: Higley to discover &c; also Arch: Dorchester & Roland Thomas l. d; likewise myself & my expense wth ym & feridge &c wch come to	1:	08:	00
To Goodman: Boltwood for his journey, advice & help &c	1:	00:	00
To his & my ferridge & Jo Artsell's expence there	00:	10:	00
To 1 Bottle of Liquor (brandy)	00:	3:	00
July 12th To 2 Bottles Liquor to L. Thomas	00:	05:	00
Aug 22d at setting downe ye dam; 1 Gallon, 1-2 Liqr	00:	15:	00
To Provisions &c	1:	15:	00
To 6 men 3d besides G. Thomas his company ye week	1:	10:	00
G. Thomas cring brick; Isaak Morgan 1 weeke G. Thomas & F. R.: bet & 1 Barrel cider	00:	12:	00
2 payt to G. Denslow	00:	14:	00
To John Warner for 3d worke	00:	06:	00
To my man getting stones filling dam &c	2:	00:	00
Richard Waite 1 weekes work	00:	12:	00
Jacob ye Dutch Lad	00:	12:	00
Aug. 1672 to 3 galons Rum	1:	00:	00
To my men	1:	02:	06
To Harry, Roco & I	1:	00:	00
John Artsell Cr.			
By making my saw mill at Stony River	55:	00:	00
By building ye house there	12:	00:	00
By making coggs & round & that mill to goe without a Rope	3:	00:	00
By allowance on pork not good and Pork my men eat beside	1:	00:	00
By allowance for setting ye mill &c to worke last weeke & ye weeks before, and for sawing 13 and 1-2 M. of Bordes	1:	05:	00
Discounted Nov 24th 1673	72:	05:	00

Nov 24th 1673 Agreed with John Artsell to tend my saw mill at Stony River till

May next. & for sawing I am to allow him 12s pr M. for Bords & Planks (only if I saw Planks for shipping: I am to allow him for them 13s per M. For slitwork I am to allow him 14s per M. He to tend ye mill carefully & to mend all yt may be amiss, keeping her and running all in order, except at a tyme so much is amiss as reqrs above 2 days worke together to mend it; then all at any tyme above 2 days work to mende or repair her I am to pay him for it. I am to pay him either in goods to his contente, or order; otherwise in wheat and Rye.

Also agreed with him to put up a roofe on ye mill, He to put up ye rafters, lay on ye bords and doe ye whole covering, all except nayles & ye loggs I find for wch I am to give & pay him sixe Pounds.

Jos. Artsell Cr.

	£	s.	d.
By 3.d; worke making my dam.	00:	06:	00
By carting of Loggs at 15d ye Log.	00:	18:	00
By fetching Bed & securing, hiding, &c. John Artsell's tooles.	00:	04:	00

Discounted pr Contra Feb 9th 1677

The following transcriptions from the official records, made by the same authority quoted above, will be found interesting:

At a Gennerall Towne meeting, March ye 3d 16^{84}_{85}

It was agreed, & voted: That if any able man, or men doe appear to errect, and set up a saw-mill, and grist-mill, upon Stony river, for sawing and grinding, and to grind corn for the sixteenth part; and to sell the Towne for their use, boards both pine, and oak at 3s 6d per hundred; they soe doing; yn the Towne doth Grant to him, or them all their rights in the streames of Stony Brook, and Muddy Brook, for yt use; and also the liberty of ye commons for cutting of Loggs, but not at all to Damnifie ye Major: [Pynchon] provided: he come up to the same tearms.

At a Generall meeting of ye inhabitants of Suffield; March ye 1st 16^{86}_{87}.

Agreed, & by a clear vote made choice of John Mighill Sen, & Jonathn Winchill Senr to treat with Colonel Pynchon, in ye Towns behalf about ye Mills.

At this Gennerall Towne meeting March ye 2d, 16^{96}_{97}: it was agreed and voted to prohibit Collonel Pynchon, or any other of the owners of the Saw-mill (now erected upon Stony River, or such as may be owners of any other Saw-mill yt may hereafter be erected within this Township, or any other person, or persons whatsoever, that may cut, and cart timber to said mill, or mills,) from cutting any Timber upon any man's Grant, or propriety of Land, forever hereafter: and that upon the penalty for the Law, for felling, and carrying away of prohibited trees or timber.

It was agreed, and voted, to send forth Serj Joseph Harmon, Nathanial Harmon, Jonathan Winchill Senr, and Robert Old Senr, with Collonel Pynchon's warrant to seiz and bring away any of our Windsor neighbors, which they shall finde within our Towne-bounds, carrying away timber, or preparing timber for carrying away.

Att a Legal Town meeting of the inhabitants of Suffield Novembr 18th 1745:

Voted to allow in Town Pay att old Tenor Price the severall Sums anexed to each mans Name (viz)

	£.	s.	d.
To Capt Joss: Kellogg for four Lod of Timber.	0	12	0
To Jonathan & Posth Siks for 250 fete of Plank 30/.	1	10	0
To Thom Spencer for 2 sticks of Timbr 4/.	0	4	0
To Daniel Spencer for 15 sticks of timbr 1/6 pr stick.	1	2	6
To John Hail for Plank 16/.	0	16	0

To Samll Siks for Plank 16/.....0 – 13 – 0
To Uriah Austin for 2 sticks of Timbr.....0 – 8 – 0
To Samll Remington for one stick of Timbr.....0 – 2 – 0
To Sd Kent for 100½ of Bords 12/.....0 – 12 – 0
To John Granger for 209 feet of Plank 33/6.....1 – 13 – 6

Att a Leagal Town meeting March 20th, 1747. . . .

4ly. Whereas the Commttee for the first setling of ye town of Suffield they Gave the Streems of Stony Brook and Mudy Brook to Collonal Pynchon for ye use of the Gristmill and Sawmill, and ye sd Pynchon Procedid to build and maintain them for the use of the town untill he Lost Two Gristmills and one Sawmill on which he Grue almost Discouraged and talked of Giving of the sd stream to the town, the Profitt being so small and the Loses so Great. On which the town came together and voted all ye Right thay hade to the Streams to any man that would appear and maintain a Gristmill and Sawmill for ye use of the Town; Giving Prefirence in sd vote unto sd Pynchon, and he Seing the Town so minded he Tock Corrage and Bulte againe and so continued to Do by himselfe and Desendants through the umanity of the town to this time. But now the town hath grown Large Som have manifested that they want more mills: Yet all tho ye town in ye capacity of a town have Never Requested nor Demanded any more mills: and Now I the subscriber hold three quarters of the sd stream by Purchis under sd Collonal Pynchon, Proposed to the town for mill following (viz.)

1st. To see whether the town will vote I should set up a mill in sum convenant Place in the West Presink.

2ly. If they Dont chuse that, to se whether thay will to have me build another mill adjoyning to this I have allredy, to Grinde Indian grain with

As witness my hand this 26 Day of March 1747.

Nathll Austin.

5ly. Voted that Dot Nathall Austin shall (when he has clered his title to ye stream) Build a mill in the West Parte of the town.

The first dam across the Willimantic was made in 1727 near the site of the present stone dam of the linen company. Thomas Hartshorn was the first Willimantic mill owner. The privilege occupied so early by Thomas Hartshorn was made over by him to his son, Ebenezer, of Charlestown, who, in 1729, sold grist mill, sawmill, water privilege and forty-acre lot to Joseph Martin, of Lebanon, for £410. In 1700 in what is now Scotland the settlement was steadily increasing. Sawmills and grist mills were erected about this time on the powerful stream near Willimantic Falls.

Bayles, in his "History of Windham County," published in 1889, says:

Little River in its course through this town [Hampton] has for many generations afforded power for sawmills and other works of moderate capacity. Some of these it may be interesting to notice. The sawmill owned by Mr. Andrew M. Litchfield was formerly owned by Mr. Ebenezer Stedman, then by Deacon Thomas Williams, from whom it was purchased by the present owner in 1825. It is located in the Bigelow district. . . . About 30,000 feet of lumber are sawed per year. . . . Further up the stream, and before we get to Litchfield's mill site, once stood a cotton factory and a sawmill and a grist mill. These were owned by Samuel and Lodowick Wolcott, and were burned several years since, the site then being abandoned. Above Litchfield's mill was a grist mill. . . . The next enterprise on the stream above was a combination shingle mill, clover mill, manufactory of German silver spoons. . . . Another

sawmill stood next in order up the stream, but has been abandoned. . . . Another sawmill stands in the south part of the town on Cedar Swamp Brook. . . .

The early part of this century . . . sawmills, a grist mill . . . were maintained upon Merricks Brook. These were carried on by members of the old families, the Devotions and the Waldos and others. . . . Most of the mills on the streams have been abandoned, but grist and sawmills are still maintained. . . .

The paper mill in the south part of Chaplin was built by Peter Lyons, Esq. . . . About a quarter of a mile below this was the old Howard saw and grist mill. A few years since, this mill was rebuilt and modified as a pulp manufactory. . . .

Here [three miles above the paper mills] for more than a hundred years, have been a saw and grist mill, generally doing a thriving business. The mill is located in the northeast corner of the town. It was established first by Benjamin Chaplin. He sold it December 2, 1771, to Nathaniel Mosely. It was an old mill then.

The townsmen of Newington on October 25, 1677, authorized the building of a sawmill at the foot of the lake, and lots of twenty acres each, in the vicinity of "Pipe Stave Swamp," were granted by the town to Emanuel Buck, John Riley, Samuel Boardman and Joseph Riley on condition that they build a sawmill "to be up and fit to work" by the last of September, 1678. It is mentioned as in existence in the spring of 1680. This lake was in the half mile common, as were these lots which were called "sawmill lots." Settlers were attracted by the lake and its mill privileges, and the well-watered valley abounded in heavy timber. Pipe staves had been obtained there long enough for the locality to be named "Pipe Stave Swamp" in the vote of the town in 1677.

February 2, 1690, it was voted that "George Griswold and Joseph Griswold shall have liberty to make a mill dam across the river at the upper end of the meadow at Poquonnuck [Windsor] provided they build a good grist mill for the use of the town within three years' time, and keep the same in good repairs; and that they shall have liberty to build a sawmill at the same place as long as they keep the grist mill in good repair. Always provided that in case of the Griswolds failing to build the grist mill within three years as before said; then this grant is to return to the town."

In Farmington one choice lot was set apart for the man who would erect a mill, and about the time the place became a town, 1645 or 1646, a sawmill was in operation. The erection of this mill was evidently a great boon to the settlers, for the records state that sawed lumber for buildings could then easily be obtained. The principal mills in the parish about the time the society was incorporated in 1754 were Judd's sawmill near the site of the first meeting house; Andrew's sawmill on the Plainville Road, built in 1757, and Hotchkiss' sawmill on Pond River near Horse Plain.

William Rosewell built a sawmill about 1672 on Beaver Brook above Great Pond, later known as Furnace Pond, in the township of Branford, New Haven County, and in 1697 Samuel Russell and others were granted the privilege of setting up a sawmill in the same township.

A sawmill was built and set in operation in 1786 at Woodstock Hill, Windham County.

The first sawmill in Marlboro, Hartford County, was built by Eleazer Kneeland in 1751 on Blackledge River. As late as 1870 large tracts of timber were cut, the lumber being shipped to Boston and eastern Connecticut for shipbuilding and railroad purposes.

Isaac Cutler's sawmill in Killington Township supplied all the local demand in 1709.

In 1692 Ginnings Hendee, Jeremiah Ripley and James Birchard were granted the privilege of the stream at Beaver Brook, Windham County, for building a sawmill, with a half mile adjoining for timber and pasture, provided the mill was completed within one year and that when the mill should be abandoned the land should revert to the town. In the following year Jonathan Ginnings and the Ripleys were granted liberty to set up a sawmill at "No man's acre brook." In 1700 liberty to build a sawmill on Goodman Hebard's Brook, and the privilege of the stream for damming and ponding were granted to several petitioners, with the privilege of taking any other stream if it should not prove satisfactory.

In 1706 Joseph Cary, John Backus, Joseph Dingley and John Waldo were granted the privilege of the stream at Willimantic Falls, Windham County, "to build a mill or mills at one particular place," wherever they might choose on the north side of the river, and to hold it as long as they and their heirs should maintain a good "sufficient" mill, with the privilege of raising a dam across the stream, also the improvement of forty acres of land, timber free, so long as the land should be left unfenced.

Abiel Lyon, of Woodstock, set up a sawmill on the Mashamoquet, in Pomfret, Windham County, in 1707.[2]

"Uriel Holmes built the first saw and grist mill in the North Hollow on the east branch of the Farmington [Hartford County]. In 1777 Stephen Bushnell built a sawmill at Mill Brook. There was another sawmill higher up the same brook. Samuel E. Woodbridge in 1818 built the sawmill now owned by Watson E. French. S. Roberts has a sawmill on the east mountain. These and portable steam mills have largely reduced the amount of timber. Most of the mills have gone to decay."[3]

About 1730 a church was built in Windham for which Jacob Bixby furnished 500 pitch pine boards at £3 a thousand. Henry Green, Junior, supplied white oak planks for the seats at 7 shillings a hundred, the slit work for the seats at 4s 6d a hundred and the heads at 9 shillings a hundred.

[2]In writing the above history of early sawmills and in compiling the subjoined table, showing number of sawmills in operation in 1819, the following authorities were largely drawn from: "The Colonial Records of Connecticut;" Camp's "History of New Britain," 1889; E. D. Larned's "Windham County," 1874; Bayles' "History of Windham County," 1889; the "Gazetteer of Connecticut and Rhode Island," Pease and Niles, 1819, and the "Statistical Account of Middlesex County, 1819.

[3]J. Hammond Trumbull's "Memorial History of Hartford County," published in 1886.

Following is a partial list of sawmills in operation in Connecticut in 1819, so far as can be gathered from the records available:

SAWMILLS IN CONNECTICUT IN 1819.

Town, township or parish.	County.	Date when settled or incorporated.	Number of sawmills.
Ashford	Windham	*1700	9
Barkhamsted	Litchfield	*1744	12
Bethlehem	Litchfield	†1787	4
Bristol	Hartford	†1741	8
Brooklyn	Windham	†1786	3
Canaan	Litchfield	*1738	15
Canterbury	Windham	*1690	9
Canton	Hartford	*1740	4
Chatham	Middlesex	†1767	12
Chester	Middlesex	.....	3
Colchester	New London	*1699	8
Columbia	Windham	†1800	6
Cornwall	Litchfield	*1738	20
Coventry	Tolland	*1709	6
Durham	Middlesex	*1699	4
East Haddam	Middlesex	†1734	19
East Hampton	Middlesex	.....	3
East Hartford	Hartford	*1634	several
East Windsor	Hartford	*1636	5
Ellington	Tolland	†1786	4
Fairfield	Fairfield	*1639	..
Glastenbury	Hartford	†1690	1
Goshen	Litchfield	*1738 or 1739	5
Groton	New London	†1705	11
Guilford	New Haven	*1639	..
Hadlyme Station	Middlesex	.....	4
Haddam	Middlesex	*1662	9
Killingly	Windham	†1708	8
Killingworth	Middlesex	.....	2
Litchfield	Litchfield	*1720	18
Lyme	New London	*1636	11
Mansfield	Tolland	*1703	10
Middlefield	Middlesex	.....	2
Middle Haddam	Middlesex	.....	10
Middletown	Middlesex	*1651	10
Milford	New Haven	*1638	..
Millington	Middlesex	.....	9
New Canaan	Fairfield	†1801	5
New Hartford	Litchfield	†1738	4
North Killingworth	Middlesex	.....	5
Norwich	New London	*1660	6
Oxford	New Haven	†1798	..
Pautapong	Middlesex	.....	7
Salisbury	Litchfield	*1720	4
Saybrook	Middlesex	*1639	6
Simsbury	Hartford	*1670	4
Somers	Tolland	†1734	4
Stafford	Tolland	*1718	12
Thompson	Windham	*1715	11
Tolland	Tolland	†1715	3
Union	Tolland	†1734	9
Upper Houses	Middlesex	.....	1
Vernon	Tolland	*1716	6
Washington	Litchfield	†1779	5
Westbrook	Middlesex	.....	4
Westfield	Middlesex	.....	1
Weston	Fairfield	*1738	12
Wethersfield	Hartford	*1634	2
Willington	Tolland	*1720	5
Wilton	Fairfield	†1802	4
Windham	Windham	*1686	10
Woodbridge	New Haven	†1784	..
Woodstock	Windham	*1686	12

*Settled. †Incorporated.

EARLY FOREST AND INSPECTION LEGISLATION.

Legislation designed for the protection of the forests, and to maintain the quality of the product is recorded as early as 1640, when the General

Court of the colony passed an order, on February 8, for the better preservation of timber, which read as follows, according to the "Colonial Records of Connecticut," the quaint orthography being retained:

And for the better prsearing of Tymber, that the Country may haue prvisions of the Pype staues [staves] for the furthering of the trade of Cotten Wooll, It is Oredred that no Tymber shall be felled fro wthout the bownds of these Plantations, wthout lycence fro the prticular Courte, nor any Pipestaues to be sould out of the Riuer wthout alowance fro the said Courte, nor transported into foraigne prts vntil they be vewed (by such Committee as the Courte shall appoynt) and apprued by such to be vendable, boath for the goodness of the Tymber, and due prportion & size thereof.

The prticuler Courte also is desired to take order for the veweing of the Pequot Country and disposeing of the Tymber there, as also the settled Inhabitants in those prts yf they see cause, so far as yt may be acted wthout chardge to the Country.

This order was repealed September 9, 1641, in the following language:

The Order for the restreyneing of the felling of Tymber is repeled, pruided that no Tymber be falen wthin three myles of the mouth of the Matabezeke river, nor at unseasonable tymes, vizt. fro the beginning of Aprill to the end of Septeber, and that it be improued about pipestaues or such other merchantable comodity wthin on month after the felling thereof, or carted togather; and that the Tymber so improued shall not be transported fro the Riuer but for dischardge of debts of fetching in some necessary prvisions.

It is ordered that the size of the Pipestaues shall be 4 foote 4 inches in length, halfe an inch at least in thickness, besids the sappe; they are to be 4 inches in bredth, if vnder to goe for halfe staues, and non are to goe if vnder 3 in bredth. And there shall be appoynted in every Towne wthin these libertyes, one experienced man to vew & obsearue all such staues as aforesaid, and ech prcell by him approued of shall be sealed, who shall be sworne to that searuice. And all such prsells so approued & sealed, shall passe to the Marchant at 5l. the thousand, to be deliuered at the Riuers mouth, at wch place the Country hath vndertook to prvid for Mr. Hopkins, by the beginning of June next, 70000, vizt. Wethersfield 30000, Wyndsor, 20000, Hartford 20000, if Mr Hopkins can pruid shipping and aford to giue that price.

February 5, 1650, the General Court ordered that no person should buy of the Indians, directly or indirectly, any timber, candlewood or trees of any sort or kind within the jurisdiction.

OFFICIAL INSPECTION OF FOREST PRODUCTS.

The "Public Records of Connecticut" show the following enactment, August 10, 1667, which is interesting because it embraces inspection rules and provides for an official inspection of forest products:

And for the due regulation of staves, be it further enacted by the authority aforesaid that in all seaport towns within this Dominion where staves are usually shipped off to be transported by sea, the selectmen or townsmen shall annually or otherwise as need shall be, choose one or more known and skillful person or persons within their town to be viewer and culler of all staves and heading to be transported. They shall be presented and sworn to the faithful discharge of their office at the next season of peace to be holden at such county and such viewers shall have power to cast by all such staves as they judge not to be merchantable either in respect of wormholes or want of assize; and that all merchantable staves be of the dimensions and assize as following,

that is to say; pipe staves to be in length four feet and a half and in breadth three inches and a half at least, without sap, in thickness three-quarter inches, well and even hewed and sufficient for use, all hogshead staves, whether of white oak or red oak, to be in length, three feet and two inches or upward; all barrel staves to be in length thirty-one inches, well and even hewed and drest and of a proportionable breadth and thickness; all heading for pipe staves to be in length twenty-eight inches and for hogshead and barrels suitable to the cask to be made thereof. And the viewer shall enter into a book the number of such staves as he approves and give a note thereof under his hand and shall be allowed two shillings per thousand for every thousand of staves he shall so search, as well the refuse as merchantable, to be paid by him who sets him at work; and all staves put on board any ship or other vessel to be exported not viewed and appointed as aforesaid shall be forfeited, the one-half to his Majesty, his heirs and successors and the other half to him or they that shall seize, inform and sue for a sum as directed: and if any master or other officer of any ship or other vessel shall receive on board such ship or vessel any parcel of staves not viewed, culled and appointed as aforesaid and so served by a note under the viewer's hand, the master of such ship or other vessel shall forfeit the sum of five pounds for every one thousand of staves so unduly received, to be disposed of for the uses and in manner aforesaid.

And it is further enacted by the authority aforesaid that from henceforth no Boards shall be cut of any pine, spruce or cedar at any sawmill within this Dominion for sale or exportation but such as shall be well sawed of the thickness of one full inch or half an inch; and all half inch Boards to remain in whole or half stocks pinned together; and no single boards shall be counted and passed for merchantable but such as are one full inch in thickness and stocks and half stocks to be full half inch thick; and all to be well and even sawed. Nor shall any man make any boards about the just and true measure thereof, either sawn or marked contrary to this act upon the survey of any sworn measurer or culler of boards to be thereto appointed; the one half of which forfeiture to be paid his Majesty and the other half to him that will inform and sue for the sum by bill, plaint or information in any court within this Dominion.

RESTRICTIONS OF TRADE.

The first attempt to limit the exportation of timber from the Colony of Connecticut was made when the following enactment was adopted by a Court of Election, which was held in Hartford May 12, 1687:

. . . Whereas the transportation of timber cut out of this Colony proves prejudiciall to the publique, this Court orders that henceforth there shall be no timber transported out of any township within this Colony without licensse from the towne within whose bownds the sayd timber grew and was gotten, upon the penalty of forfeiture of the timber soe shipped to be transported. And the master of any vessell that receives on board any timber without license as aforasayd, be it boards, slit worke, or staves, or any other timber whatsoever, he shall pay a fine of forty shillings for every breach of this order, the one halfe to the towne where the offence is committed, the other halfe to the county treasury; provided, this order respects no such sawmills as are erected by order or liberty obteyned from the Generall Court.

It is allso ordered, that if any taner or taners in this Colony shall fall or cutt downe, or cause to be cutt downe, any trees or wood in the comons, for barke, within any towne bounds, without lycense first obteyned from the towne, shall forfeit five shillings for every tree they shall fall or cutt down or cause to be fallen or cutt downe, the one halfe to the complayner, the other to the use of the poore of the towne where the offence is committed.

This was followed October 12, 1699, by the General Assembly at Hartford, by the following enactment:

Whereas the transportation of Timber out of this Colonie is found to be very prejudiciall to the publick:

It is ordered and enacted by the authority aforesaid: That henceforth there shall be no Timber transported out of any township within this Colonie, such as boards, plank, slit-work timber, staves or other timber whatsoever, without license obteined from the town within whose bounds any such timber grows or grew and was gotten (which license shall be in writing under the hands of the major part of the selectmen of such town) upon penaltye of forfeiting such timber so transported or shipped to be transported, or the full value of it, if it be proved it was transported out of any township without liberty as aforesaid; halfe of the timber or value thereof to the complainer that shall prosecute his complaint to effect, and the other halfe to the treasurye of the town in whose bounds such timber grew and was gotten; and the master of any vessell that receives on board any such timber and without license as aforesaid, shall pay a fine of five pounds for every breach of this order, one halfe thereof to the use of the town where the offence is committed, and the other halfe to the countie treasurye. Provided always that this act shall not respect such sawmills as are erected by order or liberty obteined from the Generall Court of this Colonie, or any boards, plank, staves or other timber whatsoever brought from other places into this Colonie for transportation.

At a General Assembly and Court of Election begun May 13, 1714, at Hartford, an act was passed entitled "An Act for the Preservation of the Timber Preventing the Transportation Thereof," and read as follows:

Whereas great quantities of barrel, pipe and hogshead staves are exported out of this Colony to the neighboring Provinces, to the great destruction of timber and damage of the trade of her Majesties subjects here, to the Wine Islands or the West Indies: For the Prevention thereof:

Be it enacted by the Governor, Council and Representatives in Generall Court Assembled, and by the authority of the same,

That all barrel staves that shall be shipped for exportation out of this Colony to any of the neighboring governments of Massachusetts Bay, New York, New Jerseys, Rhode Island, and New Hampshire, shall pay to the naval officers of each port where the said staves shall be shipped, and for the use of this government, the sum of twenty shillings per thousand; and all hogshead or pipe staves, the sum of thirty shillings upon every thousand which shall be shipped as aforesaid.

Be it also enacted, That if any person or master of a vessell shall (before entry made with the naval officer of the port where he shall lade his vessell with any staves in any the aforesaid Provinces, and give bond with sureties to the naval officer in said port, not to export them until he has paid the duty this act laid upon their exportation,) take on board any vessell any quantity of staves as aforesaid, and information thereof shall be given to the said naval officer of the said port, the naval officer is hereby impowered to seize the said staves so shipped and secure them; which said staves shall be forfeited, one half to the publick treasury of this colony, and the other half to the informer who shall prosecute for the same to effect at the next county court within the county where the said port in which the staves so shipped shall lye. Provided also, that this act shall not take place until the first of December next, and shall continue in force but for four years next ensuing the date of this act.

To enforce the above act the naval officers of all ports were required to secure a bond from the master of vessels, to secure the delivery of staves according to law. This enactment was passed June 22, 1715.

About this time the home shipping business had become so restricted, owing to the exportation of enormous quantities of plank, ship timber and boards to the neighboring provinces of Massachusetts, New York, New Jersey, Rhode Island and New Hampshire, that it was found necessary to enact a law for the protecting of this industry. This enactment was passed May 12, 1715, and was to remain in effect for a period of four years. It read as follows:

. . . That all plank, ship timber and boards, of the growth of this government, that shall be shipped for exportation out of this Colony to any of the neighboring governments of Massachusetts Bay, New York, New Jerseys, Rhode Island and New Hampshire, shall pay to the naval officers of each port where the said ship timber, or plank, or boards shall be shipped, and for the use of this government, the sum of ten shillings for every tun of ship timber, and the sum of five shillings for every hundred foot of plank, and three shillings for every hundred foot of boards which shall be shipped as aforesaid.

And be it further enacted by the authority aforesaid, That upon the complaint of the breach of either this act or a certain act respecting staves, made in May last, if any owner of said timber, plank, boards or staves, shall plead justification, that the said timber, plank, boards or staves, were not of the growth of this Colony, that the *onus probandi* shall ly on him that made the plea; and further, that when no such plea is made, it shall be taken *pro confesso* that the growth was of this government. . . .

In May 1718, the General Assembly took up the question of timber stealing and passed a law making it a misdemeanor and liable to a fine. Anyone convicted of stealing a tree or staddle of one foot or over at the stub was punished by a fine of 5s; for each tree of one foot and under two feet, 10s, and for each tree two foot over, or more, at the stub, 20s, over and above the value of the trees so felled, the value of timber cut to be judged by two free-holders under oath.

At a General Assembly held at New Haven October 9, 1729, the Governor read to the Assembly an act passed by the Parliament of Great Britain, governing the cutting of white pine in the colonies, which read as follows:

An Act for better regulation of his Majesties woods in America, and for the encouragement of the importation of naval stores from thence, and to encourage the importation of masts, yards and bowsprits from that port of Great Britain called Scotland. —by the King's most Excellent Majesty, Be it enacted by and with the advices and consent of the lords spiritual and temporal, and Commons in this present Parliament assembled, and by the authority of the same, That from and after the 29th day of September next, no person or persons within the Colony of Connecticut, &c., do, or shall presume to cut, fell or destroy any white pine trees, except only such as are the property of private persons, notwithstanding the said trees do grow within the limits of any township laid out, or to be laid out hereafter, in the said Colony, without his Majesties royal lycence for so doing first had and obtained. And those who shall be aiding or

assisting therein, or in drawing away the said pine trees after the same shall be cut and fell, shall be a subject to the like penalties and provisions as are provided in an act in the eighth year of his late Majesty entituled An Act giving further encouragement for the importation of naval stores, and for other purposes therein mentioned.

Which act of Parliament all courts, churches, and justices in this colony are by the Governor, Council and Representatives, in General Court assembled, and by the authority of the same, directed to observe and execute as the law of this colony; and all persons are required to conform themselves thereunto, on the pains and penalties above referred to; which penalties are as followeth, viz.: For every white pine tree of the growth of twelve inches diameter and more, the sum of five pounds; those from twelve inches diameter to eighteen inches diameter, ten pounds; those from eighteen to twenty-four inches, twenty pounds; and those from twenty-four inches diameter and upwards, the sum of fifty pounds.

An enactment was passed May 14, 1752, imposing a fine for taking sawmill logs and other timber, shingles and staves floating down the Connecticut River. In October, 1771, a similar law was enacted applying to the Windsor Ferry River.

Owing to the fact that large quantities of all kinds of lumber were continually being exported from Connecticut to the neighboring colonies to the great destruction of timber, which was of vital import to the shipping industry, and did great damage to the West India trade, an export tariff law was enacted in May, 1747, in the following language:

. . . That for all lumber of the growth of this Colony that shall at any time after the first of October next be shipped on board any vessell for any port, river, harbour, road or place of lading in this Colony, for exportation to either of the governments of Massachusetts, New York, Rhode Island or New Hampshire, shall be paid a duty for the use of this government, as followeth (viz.)

Fifteen shillings for each thousand of barrel staves.

Twenty shillings for each thousand of hogshead staves.

Thirty shillings for each thousand of pipe or butt staves.

Thirty shillings for each thousand of hogshead heading.

Fifteen shillings for each thousand of barrel heading.

Twenty shillings for every tun of ship timber.

Five shillings for every hundred foot of plank.

Two shillings and six pence for every hundred foot of boards, and

Twenty shillings for every cord of bark.

All in bills of credit of this Colony new tenour, or in other bills of this Colony equivalent thereto.

And, that the said duties may be effectually collected and paid,

It is further enacted by the authority aforesaid, That the several duties by this act laid shall be paid to and received by such collector or collectors of duties as shall be appointed by the Governor of this Colony for the time being for the collecting of duties arising on the importation and bringing in of goods from the neighboring governments, out of which duties such collectors shall receive, five *per centum* for their trouble therein.

That if any person or master of a vessel shall ship or take on board any vessel for any port, river, harbour, road or place of lading in this colony, any quantity aforementioned sorts of lumber for exportation to any of the aforesaid neighboring governments before entry thereof made with one of the aforesaid collectors of duties, and

bond with surety given not to export such lumber to the said neighboring governments, or shall export the same to any of the said governments before the duty by the act laid shall be paid, the said lumber so shipped and put on board contrary to this act, or the value thereof, shall be forfeited, one half to the Treasurer of the colony for the use of the government, and the other half to the informer who shall prosecute the same to effect.

That the said lumber so shipped may be seized by such collector, or by warrant from any assistant or justice of the peace, and secured for tryal at the next county court in the county where such seizure shall be made; which court on information made of the transgression of this act may hear and determine the same, and give judgment for the forfeiture and sale of such lumber as shall appear to be shipped contrary to this act; and in case no seizure be made, they shall give judgment for the value of said lumber so exported against him or them who exports the same contrary to this act, and award execution thereon for the uses aforesaid, accordingly; and that if on the tryal of any such cases there shall arise a dispute about the growth of the said lumber, the burthen of proof shall lye on the shipper, owner or claimer of such lumber, and if no claimer or owner appear or no plea or dispute opens about the growth of such lumber, it shall be presumed and taken for granted that such lumber was of the growth of this Colony; any law, usage or custom to the contrary in anywise notwithstanding.

Norfolk, Fairfield County, as early as 1653, enacted a legislative measure looking to the governing of the felling of timber in the township. The law, as passed by the townsmen, at a meeting held December 18, 1653, reads as follows:

FELLING TIMBER.

Agreede and voted at the aforesayd meetinge, that if there shall be any timber felled in any of the commonage belonging to the town of Norwake—or—uncorded beyond the space of three mounthes, from the date hereof, that is to say December 29, 1653, then it shall be lawfull for any planter to use and carry away the said timber as their proper owne.

Agreed and voted at the aforesaid meetinge that if any inhabitant shall fall or cause to be fallen any tree into any common cartway and not cause said tree to be removed within the space of ..... houres, so as to be noe annoyance to the saide cartway, that then it shall be lawful for any of the inhabitants to remove the saied tree and ..... planter that did fall said tree ..... to ..... that removed the tree the some of ..... in good current pay.

In later years there was little need for an export duty or any other precaution; for the needs of a growing community, both for lumber and the returns which might be realized from forest products, eventually brought about the practical end of the lumber industry in Connecticut.

Although Connecticut was originally a timber state of some importance and was one of the first political divisions of America to enact legislation intended to preserve the forests from destruction, its lumber industry of today is confined to very small operations and the product, small in the aggregate, is consumed locally. The bulk of the soft wood, chiefly spruce, used in the State is brought from Maine and New Brunswick by vessel, the principal ports of discharge being New Haven, New London, Bridge-

port, Stamford, Norwich, Norwalk, and Middletown. These ports receive a considerable part of the spruce sawed at Bangor. White pine is also received either by rail, or by vessel via the Hudson River and Long Island Sound.

LUMBER STATISTICS.

The United States census for 1900 shows that the amount of capital invested in the lumber industry at the beginning of the Twentieth Century, was $1,188,965, and that the proprietors and firm members numbered 249. The salaried officials, clerks, etc., numbered 38. They received annually $30,396. The total number of wage-earners, all males over sixteen years of age, was 1,074. The average amount invested in machinery in each plant was $1,548; the average annual product, $9,093; average number of wage-earners in each establishment, 4. The average total wages paid in each establishment was $1,535. The average product of each wage-earner annually was $2,308. The average wages of each wage-earner were $389. The average quantity of merchantable timber reported was 9,200 feet an acre; but the reports regarding the timber feature of the census were very limited and unsatisfactory, information relating thereto not being insisted upon. The following table, compiled from the census reports from 1850 to 1900, inclusive, shows, in a condensed form, the amount of capital invested, number of wage-earners, amount of wages paid, cost of materials used and the value of products:

COMPARATIVE LUMBER STATISTICS, 1850-1900—CONNECTICUT.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments....	239	208	393	300	176	200
Capital.....	$308,150	$386,800	$775,301	$657,300	$1,092,586	$1,188,965
Number of wage-earners	371	311	908	707	783	1,074
Wages.....	$97,302	$89,878	$242,990	$178,336	$254,926	$416,290
Cost of materials used.....	$277,831	$377,580	$940,665	$641,569	$765,751	$572,960
Value of products	$534,794	$589,456	$1,541,038	$1,076,455	$1,353,544	$1,818,643

[1] Prior to 1890 reports of "timber camps" were not taken but have been included with the figures of the other branches of the industry for 1890 and 1900.

In the subjoined table, showing the quantity and value of Connecticut forest products for the census year of 1900, comprising rough lumber, shingles and other sawed products, timber camp products and planing mill products, it will be seen that white pine leads the conifers, and the chestnut the hardwoods. The State is naturally fortunate in being the home of these rapid growing and valuable trees. On the authority of Austin F. Hawes, State Forester of Connecticut, the chestnut is the leading commercial tree in the State, he estimating it as composing over one-half of the timber of the Commonwealth. The present stands of chestnut are of sprout growth, the virgin forests having been exhausted before the Revolutionary War. The table shows a grand total of all forest products of $2,079,704:

FOREST PRODUCTS OF CONNECTICUT—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b.m.	Value.
CONIFERS:		
Yellow pine	2,575,000	$ 51,125
White pine	23,797,000	281,548
Hemlock	3,308,000	46,920
Spruce	100,000	1,200
Cypress	100,000	3,000
Cedar	120,000	3,600
Total, conifers	30,000,000	$387,393
HARDWOODS:		
Ash	158,000	$ 4,470
Birch	460,000	6,780
Chestnut	64,506,000	954,337
Cottonwood	25,000	1,000
Elm	3,000	75
Hickory	270,000	7,848
Basswood	78,000	2,050
Oak	10,814,000	210,071
Poplar	80,000	1,215
Black Walnut	62,000	1,600
Maple	413,000	8,326
Other hardwoods	725,000	13,350
Total, hardwoods	77,594,000	$1,211,122
Total, rough lumber	107,594,000	$1,598,515

SHINGLES.

	Quantity, pieces.	Value.
White pine	968,000	$2,359
Cedar	225,000	675
Hemlock	260,000	631
All hardwoods	1,761,000	4,928
Total, shingles	3,214,000	$8,593

OTHER SAWED PRODUCTS.

	Quantity.	Value.
Bobbin and spool stock, feet b. m.	40,000	$ 400
Furniture stock, feet b. m.	133,000	4,455
Agricultural implement stock, feet b. m.	62,000	1,935
Carriage and wagon stock, feet b. m.	251,000	9,221
Pickets and palings, feet b. m.	13,000	175
Lath, pieces	418,000	643
All other sawed products	.....	38,563
Total, other sawed products	.....	$55,392

TIMBER CAMP PRODUCTS.

Fence posts, pieces	51,600	$ 6,677
Hewed timber, feet b. m	171,000	1,728
Logs cut for export, feet b. m	35,000	470
Logs cut for domestic sale, feet b. m.	2,500,000	18,470
Handle stock, cords	555	4,535
Hemlock bark, cords	25	100
Piles, pieces	7,380	16,503
Railway ties, pieces	464,225	160,122
Rived or shaved shingles, pieces	150,000	300
Ship knees, pieces	386	672
Telegraph poles, pieces	31,910	86,690
Wheel stock, cords	468	3,380
Charcoal, bushels	91,200	8,562
All other products	.....	43,009
Amount received for contract work	.....	10,124
Total, timber camp products	.....	$361,342
Total, planing mill products	$152,997	
Less value of lumber used	97,135	$55,862
Grand total, value forest products	.....	$2,079,704

In the compilation which follows it will be found that the figures for 1900 differ from the census reports of that year. This is accounted for by

the fact that in 1905, in making the canvass of the lumber mills of manufacturing establishments conducted under what is known as "factory system," exclusive of the so-called neighborhood and mechanical industries, it was found necessary, in order to conform with the law, to omit sawmills engaged exclusively in custom sawing and those whose output was consumed in the immediate neighborhood of its manufacture. In order to make the figures for 1900 comparable with those of 1905, the total for the former census was revised. Fortunately, the schedules for that census were available and a retabulation was made conforming as closely as possible to the census of 1905. As can readily be seen by a glance at the table below, this once densely forested State does not at the present day support a lumber industry of any great proportions, as in 1905 it contained only 114 establishments, and the total value of products was only $1,606,467—less than that of many individual mills today in the West or South.

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—CONNECTICUT.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	139	[1]114
Capital	$791,037	$839,567
Salaried officials, clerks, etc.:		
Number	38	[1]34
Salaries	$20,396	$27,378
Wage-earners:		
Average number	1,202	[1]1,069
Wages	$450,955	$493,031
Miscellaneous expenses	$197,933	$236,070
Cost of materials used[2]	$553,460	[1]$544,015
Value of products[2]	$1,748,881	[1]$1,606,467
Quantity, Value and Principal Varieties of Rough Lumber:		
White pine:		
Thousand feet b. m.	22,805	13,663
Value	$268,013	$177,148
Hemlock:		
Thousand feet b. m	3,250	3,633
Value	$45,944	$49,421
Birch:		
Thousand feet b. m.	460	768
Value	$6,780	$11,801
Chestnut:		
Thousand feet b. m.	58,398	26,661
Value	$856,677	$381,650
Hickory:		
Thousand feet b. m.	190	468
Value	$5,258	$12,593
Oak:		
Thousand feet b. m.	9,939	22,703
Value	$193,145	$398,759
Maple:		
Thousand feet b. m.	413	263
Value	$8,326	$2,604
Walnut:		
Thousand feet b. m.	55	285
Value	$1,375	$8,200
All others:		
Thousand feet b. m.	4,405	932
Value	$95,521	$12,834
Total quantity, thousand feet b. m.	99,915	69,376
Total value	$1,481,040	$1,055,010

[1]Decrease.

[2]Includes a duplication—the value of rough lumber which in 1905 amounted to $44,213 remanufactured in planing mills connected with sawmills producing it.

EXPORTS AND IMPORTS OF FOREST PRODUCTS.

Subjoined are tables showing the value, and in some cases the quantities of exports and imports of forest products as found in reports made to the Federal Government from the different customs districts in Connecticut:

EXPORTS AND IMPORTS OF NEW HAVEN, 1856-1905.

Year.	Exports.				Imports.			
	Boards, deals and planks.		All other unmanufactured.	All manufactures.	Boards, deals and planks.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Value.	Value.	Feet.	Value.	Value.	Value.
1856	.....	.....	$ 73,466	$ 17,283	.....	.....	.....	.....
1857	33,000	$ 851	51,054	19,212	.....	.....	.....	.....
1858	44,000	1,008	40,169	16,242	.....	.....	$ 65	.....
1859	111,000	1,960	54,485	12,469	.....	.....	.....	.....
1860	141,000	1,939	.....	20,572	.....	.....	.....	.....
1861	13,000	222	51,535	29,118	.....	.....	.....	.....
1865	150,000	5,518	89,453	3,783	.....	.....	.....	.....
1867	81,000	2,480	24,723	32,048	.....	.....	.....	.....
1868	23,000	600	60,090	33,969	686,000	$ 5,527	141	$ 1,418
1869	13,000	117	45,880	1,271	.....	.....	18	[1]6,568
1870	.....	.....	24,788	3,240	.....	.....	.....	[1]16,844
1871	30,000	650	50,063	9,469	1,605,000	11,667	2,174	.....
1872	5,000	140	46,720	2,193	1,964,000	13,126	2,072	.....
1873	35,000	1,550	47,716	868	1,536,000	11,371	6,267	.....
1874	.....	.....	35,358	1,045	273,000	1,653	1,527	.....
1875	11,000	250	30,011	3,714	327,000	2,082	2,356	.....
1876	39,000	1,776	10,948	870	.....	.....	1,055	.....
1877	35,000	680	16,545	180	102,000	559	964	17
1878	81,000	1,705	10,227	987	.....	.....	971	.....
1879	195,000	3,665	9,320	1,625	173,000	1,729	1,118	10
1880	147,000	3,190	9,586	1,468	126,000	825	1,981	.....
1881	28,000	608	9,942	982	438,000	3,884	3,529	.....
1882	142,000	3,702	10,515	5,291	400,000	3,515	5,733	.....
1883	84,000	2,116	34,179	19,064	594,000	5,541	2,602	.....
1884	198,000	5,304	5,761	367	177,000	1,692	3,344	.....
1885	.....	.....	6,290	70	58,000	406	2,002	48
1886	104,000	1,840	5,236	115	174,000	1,756	1,523	240
1887	2,000	36	5,197	156	.....	.....	1,697	4,084
1888	.....	.....	5,875	86	.....	.....	795	462
1889	6,000	124	6,190	70	.....	.....	1,195	795
1890	.....	.....	1,211	.....	139,000	1,254	.....	612
1891	.....	.....	.....	.....	102,000	994	2,980	2,320
1892	.....	.....	.....	.....	246,000	2,457	969	4,921
1893	.....	.....	.....	.....	744,000	7,172	8,975	913
1894	.....	.....	.....	.....	375,000	3,445	5,528	354
1895	.....	.....	.....	.....	1,964,000	19,194	2,659	906
1896	.....	.....	.....	.....	5,047,000	49,329	10,131	1,049
1897	.....	.....	.....	.....	2,092,000	20,007	12,632	4,298
1898	.....	.....	.....	.....	244,000	2,167	9,262	11,720
1899	.....	.....	.....	.....	326,000	2,808	3,700	13,351
1900	.....	.....	.....	.....	336,000	2,970	3,960	13,906
1901	.....	.....	.....	.....	259,000	2,171	1,751	7,687
1902	.....	.....	.....	.....	546,000	5,327	5,572	10,260
1903	.....	.....	.....	.....	572,000	5,993	11,462	14,405
1904	.....	.....	.....	.....	784,000	7,064	2,439	20,557
1905	.....	.....	.....	.....	1,215,000	10,710	1,641	11,493

[1]Includes all wood and manufactures except cabinet wood.

The export figures for New Haven in the column covered by the caption "All other unmanufactured" are made up of timber valued at $152,301; shingles, $14,398; shooks, $374,780; staves, $262,590, the remainder is made up of all other unmanufactured. Under "All manufactures" will be

found furniture, $14,573; hogsheads and barrels, $28,716; woodenware, $1,100, and the balance is made up of all other manufactured. In the imports the unmanufactured figures include, besides boards, deals and planks, timber, valued at $5,500, and other lumber, $52,576. Under manufactures are included furniture, valued at $7,229, and wood pulp, $100,968.

EXPORTS AND IMPORTS OF NEW LONDON, 1856–1905.

Year.	Exports.				Imports.			
	Boards, deals and planks.		All other unmanufactured.	All manufactures.	Boards, deals and planks.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Value.	Value.	Feet.	Value.	Value.	Value.
1856	443,000	$ 11,076	$ 368	$ 42,661	.....	.....	.....	.....
1857	7,513,000	24,528	.....	79,210	.....	.....	$ 96	.....
1858	88,000	2,033	2,265	80,924	.....	.....	.....	.....
1859	73,000	2,281	30,003	11,630	.....	.....	.....	$ 51
1860	175,000	4,562	23,613	20,970	.....	.....	.....	.....
1861	30,000	670	7,520	2,688	.....	.....	2,296	.....
1865	107,000	3,772	14,959	894	.....	.....	.....	.....
1867	.....	.....	10,845	4,566	.....	.....	.....	.....
1868	13,000	471	7,095	2,964	253,000	$ 2,035	.....	462
1869	46,000	1,449	15,069	661	.....	.....	.....	11,136
1870	42,000	1,115	25,194	1,349	.....	.....	.....	13,800
1871	37,000	1,137	21,653	910	889,000	5,705	3,113	46
1872	53,000	1,468	17,974	769	370,000	2,514	1,782	244
1873	12,000	384	6,857	3,703	421,000	3,517	7,797	.....
1874	7,000	345	11,406	5,225	.....	.....	5,764	.....
1875	27,000	705	23,679	6,483	.....	.....	2,465	.....
1876	14,000	252	10,475	6,402	.....	.....	387	.....
1877	13,000	323	15 707	5,105	.....	.....	570	.....
1878	95,000	1,448	14,659	5,663	.....	.....	604	.....
1879	76,000	1,197	8,905	3,499	.....	.....	498	.....
1880	2,000	37	3,750	2,172	.....	.....	1,222	.....
1881	.....	.....	992	959	.....	.....	.....	.....
1882	.....	.....	1,140	1,137	.....	.....	.....	.....
1883	.....	.....	925	2,288	.....	.....	564	.....
1884	3,000	75	4,255	142	21,000	189	660	380
1885	43,000	826	7,253	110	.....	.....	653	.....
1886	.....	.....	.....	.....	.....	.....	240	.....
1887	.....	.....	1,615	.....	.....	.....	277	.....
1888	.....	.....	.....	.....	20,000	164	1,842	.....
1889	.....	.....	.....	.....	.....	.....	74	.....
1890	.....	.....	1,400	.....	.....	.....	285	9,846
1891	.....	.....	.....	.....	.....	.....	1,152	.....
1892	.....	.....	.....	.....	318,000	2,728	1,131	.....
1893	.....	.....	.....	.....	.....	.....	1,601	.....
1894	.....	.....	.....	.....	288,000	2,598	1,282	.....
1895	.....	.....	.....	.....	791,000	7,148	1,797	.....
1896	.....	.....	.....	.....	1,904,000	18,475	6,582	.....
1897	.....	.....	.....	.....	827,000	7,962	8,393	.....
1898	.....	.....	.....	.....	337,000	2,690	3,460	1,576
1899	.....	.....	.....	.....	651,000	8,335	7,563	4,105
1900	.....	.....	.....	.....	565,000	5,113	3,385	.....
1901	.....	.....	.....	.....	349,000	2,709	6,156	.....
1902	.....	.....	30,750	.....	338,000	3,228	1,519	.....
1903	.....	.....	31,648	.....	117,000	1,515	2,538	1,800
1904	406,000	9,758	11,546	.....	476,000	5,328	1,185	3,393
1905	1,173,000	51,688	.....	.....	.....	.....	912	10,131

[1]Includes all wood and manufactures of except cabinet wood.

In the exports for New London under "All other unmanufactured" are included timber, valued at $24,292; shingles, $6,559; shooks, $180,474; staves, $67,860. Under all manufactured will be found furniture to the value of $4,396 and hogsheads and barrels, $1,776. In the imports the "All other unmanufactured" column includes timber, valued at $3,747; shingles, $27,887, and other lumber, $18,894.

EXPORTS AND IMPORTS OF FAIRFIELD (PORT, BRIDGEPORT), 1859-1905.

Year.	Exports.		Imports.			
	All unmanufactured.	All manufactures.	Boards, deals and planks.		All other unmanufactured.	All manufactures.
	Value.	Value.	Feet.	Value.	Value.	Value.
1859	$1,700	$707	.....	.....	.....	.....
1868	25	285	.....	.....	$ 83	.....
1869	.....	.....	.....	.....	.....	$ 1305
1870	250	.....	.....	.....	387	1699
1871	.....	.....	.....	.....	115	.....
1872	.....	.....	244,000	$ 1,859	15	.....
1878	.....	35	.....	.....	.....	.....
1879	.....	150	.....	.....	618	.....
1880	.....	.....	.....	.....	1,630	.....
1881	.....	.....	149,000	1,220	1,014	.....
1882	.....	.....	.....	.....	501	.....
1883	.....	5	117,000	1,204	92	.....
1884	.....	.....	.....	.....	1,501	.....
1886	.....	.....	169,000	1,734	358	.....
1887	342	71	214,000	2,440	.....	.....
1888	.....	.....	258,000	2,569	920	5,159
1889	.....	.....	.....	.....	941	.....
1890	.....	.....	123,000	1,172	3,563	.....
1891	.....	.....	152,000	1,365	4,924	1,096
1892	.....	.....	89,000	1,026	3,292	999
1893	.....	100	1,358,000	13,683	3,696	4,268
1894	.....	.....	437,000	3,926	6,481	622
1895	.....	.....	3,255,000	32,644	5,897	294
1896	.....	.....	5,590,000	54,720	5,961	348
1897	.....	.....	3,661,000	37,945	9,650	76
1898	.....	.....	388,000	3,635	3,951	88
1899	.....	.....	1,809,000	16,776	4,425	.....
1900	.....	.....	589,000	5,308	2,041	300
1901	.....	.....	430,000	3,223	6,425	274
1902	.....	.....	2,977,000	26,531	17,915	595
1903	1,708	250	2,413,000	23,196	13,800	273
1904	.....	.....	2,520,000	23,773	8,940	538
1905	4,549	.....	3,163 000	31,838	15,104	41,718

[1]Includes all wood and manufactures except cabinet wood.

MINOR PORTS OF CONNECTICUT, 1856-1905.

Name of District.	Wood exports, value.				Wood imports, value.			
	Unmanufactured.		Manufactured.		Unmanufactured.		Manufactured.	
	Sawed lumber.	All other unmanufactured.	Cabinet wares and furniture	All other manufactures.	Sawed lumber.	All other unmanufactured.	Cabinet wares and furniture.	All other manufactures.
Hartford	$ 23,487	$ 2,096	.....	.....	$ 25,937	$ 1,643	$ 3,091	$ 21,852
Middletown	4,760	1,236	$ 1,662	$ 857	.....	.....	237	1,517
Stonington	12,864	21,023	.....	11,250	217,125	67,770	.....	.....
Other ports	32,677	224,603	5,994	97,544	.....	1,742	.....	.....

CHAPTER XIX.

RHODE ISLAND.

The original forests which covered the Rhode Island and Providence Plantations have entirely disappeared, and for many years the Commonwealth has been in a state of high cultivation. The only timber at the present time is second or third growth, and little, if any, is of merchantable character. The area covered by tree growth, however, is slowly increasing, although, with the exception of young forests of white pine, the productive capacity of the woodlands is, in view of the heavy demand continually made upon them, especially by the railroads, rapidly diminishing. Practically all of the timber reported as cut within the State is shipped from adjoining territory. The woodland of the State has an area, as estimated from the maps of the United States Geological Survey, of 400 square miles, or 37 percent of the area of the State.

Rhode Island was founded by Roger Williams, who fled from Puritan persecution and settled the Providence Plantations in 1636. Mr. Williams was accompanied in his exile by five companions, viz., William Harris, John Smith, Francis Wicks, Thomas Angel and Joshua Barlin. Mr. Williams was no believer in the principle of controlling through civil government the consciences of men, and his frank avowal in regard to his views incurred the censure of the Puritan magistrates of the Colony of Massachusetts Bay so that it was resolved to expel him from the colonial bounds; but when it was learned that he proposed to found another colony, the magistrates determined to ship him back to England. Mr. Williams received timely warning of this intention, however, and fled into the wilderness, where for many weeks he wandered "not knowing what bread or bed did mean," but the spring of 1636 found him planted on the east side of the Seekonk River. The authorities of the Plymouth Colony claimed jurisdiction over this territory and he proceeded around what is now Fox Point and up Providence River and landed at the site of the future town, where he selected a dwelling place for himself and his companions. His main object, as he stated at the time, was "the settling of a plantation and especially for the receiving of such as were troubled elsewhere about the worship of God." William Blackstone was the first settler in Rhode Island, however, removing there from Boston in 1634.

In 1638 these pioneers were followed by William Coddington and a few

others, who, also, were practically exiled from Massachusetts on account of their religious principles. These found a home on the island of Aquidneck and established the settlements of Newport and Portsmouth. Immigration continued to such an extent that in 1643 Roger Williams went to England and secured a charter, embracing the towns of Providence, Newport and Portsmouth under the name of the "Providence Plantations in the Narragansett Bay in New England." This charter did not take effect until 1647, when the first General Assembly convened at Portsmouth.

The war between the Indian tribes and the settlers, which broke out in 1675, caused untold suffering and great loss of life and did not end until the death of King Philip in 1676. Rhode Island in 1709 secured by purchase from the Indians most of the land that it now occupies as a State.

It has been stated above that there is little, if any, timber of merchantable size in the State. This was not always the case, however, for Bishop in his "A History of American Manufactures," published in 1868, says: "Rhode Island, whose principal exports were lumber, pipe staves, etc., as early as 1639–40 enacted a law to regulate the price of boards and clapboards at the mill, indicating that the colony had already possessed those useful appurtenances in the new settlements. The prices were fixed at eight shillings the hundred for sound boards delivered at the mill, and one shilling a foot for clapboards and fencing, to be sound and merchantable stuff. A sawmill appears, however, not to have been built on the Falls of Pawtucket, now so profitably applied to other uses, until after the Revolution. In 1810 the State contained twenty-eight sawmills."

Hakluyt, in his "Voyages," Volume III, published in London in 1800, says: "In the spring of 1524 Verruzano passed Block Island without embarking, which he described as being 'in form of a triangle, distant from the mainland ten leagues, about the bigness of the Island of Rhoades; it was full of hills, covered with trees, well peopled, for we saw fires along the coast. We gave it the name of your Majesty's mother.' "

A more recent writer, Livermore, in his "History of Block Island," published in 1877, says: ". . . A thorough searching . . . in some of the old and most illegible records has brought to light the fact that when the island was settled, heavy forest timber was abundant here, and supplied the people with wood for fuel and timber for buildings and fences. In an inventory of Robert Guthrie's estate, in 1692, mention was made of 'forty-two acres *in the west woods*, at twenty shillings per acre.'

" . . . In 1714 the town enacted 'That no manner of persons whatever may cut any timber, trees or poles on any man's land without his leave, and if any person do he shall pay the sum of five shillings for every tree or pole so cut.'

" . . . The kinds of timber most common here were oak, elm, pine,

hickory, ash and cedar, with a thick growth of alders, in swampy places, which were small and numerous."

Again, William P. Sheffield, in an historical address delivered July 4, 1876, in the city of Newport, said:

Tradition has it that the first settlers at Newport found the present site of the city a thickly wooded swamp. It is said that tall forest trees were then growing from the bottom to the summit of the hill, that these were first cut away, until they came down to low marshy ground, made impenetrable by the dense underbrush. Nicholas Easton, William Brenton and Thomas Hazard are said to have contracted with three Indians to clear up the underbrush for a coat, the large brass buttons on which were taken off, strung together, and were thus used as a necklace or ornament by one of the Indians. The Indians fired the underbrush, and that cleared the lowland on the margin of the harbor. Much sand and gravel, it is said, was filled in upon the low ground. Mr. Jaffrey, William Dyer and John Clarke were the committee of proprietors to lay out the town lots. Thames Street was first laid out, one mile in length. The first lots were laid off on the north side of what is now Washington Square. All the lots on the east side of Thames Street were assigned space beside on the west between the street and the water. The first landing place was at a point of land then projecting into the water north of the present site of Long Wharf. At the time of the first settling of Newport, Brenton's Neck and Goat Island are said to have been covered with large forest trees.

Horace A. Keach's "Burrillville," published in 1856, stated that in the preceding year there were 16,262 acres of woodland in that town, from which 8,500 cords of wood, 7 tons of shipped timber, 73 cords of tanbark, 27,000 hoop poles, 408,000 feet of lumber, 1,582,000 shingles and 68,100 bushels of charcoal had been cut and sold. In 1815 there were large pine forests in Burrillville, for Mr. Keach said: "The effects of the terrible tornado of September 23, 1815, are still visible at Burrillville. We had large pine forests slightly rooted in a light soil, and whole acres were laid prostrate. The hunter in our woods often stumbles over an old log half bedded in the ground and thickly covered with a deep green moss. When the farmers collect their fuel in the autumn, they break off the pitchpine knots, and during the long winter evenings the big fireplace is ruddy with their glow, and the women knit, the old men smoke, children play, and kittens purr around the cheerful light."

The earliest figures obtainable showing the extent of woodland were found in the "Rhode Island Colony Records," which showed that in the year 1767 there were 241,686 acres of woodland, valued at about $1,186,730. The following compilation shows the number of acres of woodland by counties and townships and the value of same:

WOODED LAND IN RHODE ISLAND IN 1767.

Counties.	Towns.	Number of acres of woodland.	Value of woodland in each town.
			£ s d
Newport	Newport	.....	.....
	Portsmouth	257½	1,375 00 0
	New Shoreham	.....	.....
	Jamestown	82½	895 00 0
	Middletown	54½	273 00 0
	Tiverton	7,305	11,789 07 0
	Little Compton	867	2,252 18 0
Providence	Providence	136	486 18 0
	Smithfield	17,148½	18,840 17 0
	Scituate	34,688½	18,301 16 0
	Gloucester	29,317	16,366 06 0
	Cumberland	5,732	5,147 15 0
	Cranston	6,100½	11,044 00 0
	Johnston	5,787¼	6,607 11 0
	North Providence	2,438	3,191 07 0
Kings County	Westerly	5,717½	9,400 17 0
	North Kingstown	8,098	17,544 18 0
	South Kingstown	13,198	28,783 07 6
	Charlestown	7,767	10,793 15 0
	Richmond	12,989	7,325 02 0
	Hopkinton	15,301½	11,847 14 0
	Exeter	21,182	12,370 01 0
Bristol	Bristol	279	1,008 08 0
	Warren	616	1,580 00 0
Kent	Warwick	7,261	15,352 04 0
	East Greenwich	2,695	6,214 00 0
	West Greenwich	13,689	7,873 03 0
	Coventry	22,979	10,681 11 0
Total		241,686	£237,346 15 6

Over 100 years later, or in 1875, the area of woodland had decreased 85,232 acres. In that year the State census gave the acreage of woodland and unimproved lands by counties, also value of forest products for that year. The following statement was made up from data thus afforded by F. B. Hough in his "Report Upon Forestry," published in 1877:

ACTUAL AND RELATIVE AMOUNT OF WOODLAND AND VALUE OF FOREST PRODUCTS IN 1875.

Counties.	Total acres.	Acres of woodland.	Acres unimproved, not woodland.	Percentage of total acres.		Value of forest products, year ended June 1, 1875.
				Woodland.	Unimproved, not woodland.	
Bristol	11,280	1,567	361	13.9	3.2	$ 2,217
Kent	79,348	28,560	7,184	35.9	9.1	52,469
Newport	54,921	7,476	2,376	13.5	4.3	25,041
Providence	180,255	71,780	4,345	39.8	2.4	126,737
Washington	155,124	47,071	10,015	33.4	6.4	40,602
Total	480,928	156,454	24,281	32.5	5.05	$247,066

The shipbuilding business of Rhode Island was one of the first of its manufacturing industries, and had reached considerable proportions before the end of the Seventeenth Century. Its fame as a shipbuilding colony had reached the sister colonies at that time. It will be of interest to quote from "State of Rhode Island and Providence Plantations at the End of the Century," 1902, edited by Edward Field, A. B., as showing the extent of this industry, inasmuch as it was necessary to utilize the forests to build the ships. Mr. Field says:

. . . Before the close of the Seventeenth Century shipbuilding had become an important business at Newport, and it was also carried on at Warren, Bristol and other coast settlements, including Providence and Warwick. In answer to a request from the British "Lords of Trade," in 1680, regarding various matters, Governor Sanford's answer, so far as it related to shipping, was: "We have no shipping belonging to the colony, but only a few sloops." The colony had been accused of lawlessness, and as there was danger of its charter privileges being taken away, the Governor's answers were framed in such a guise as to convey the impression that the settlers were living under very humble conditions. It was probably a fact that at that very time the colony was well supplied with shipping, and was carrying on a thriving trade with the other colonies and the West Indies. At all events, there was considerable shipbuilding done here about two centuries ago. One hundred and three vessels were built in the ten years from 1698 to 1708, eight of which were ships. In 1704 the colonial General Assembly imposed a tonnage duty on all vessels not wholly owned by its inhabitants.

In 1709 Edward Wanton, a shipbuilder from Scituate, Massachusetts, came to Newport and established a shipyard, and the colony purchased one of his vessels—the sloop *Diamond*—for £400, and chartered another, and fitted them up as ships of war to take part in the expedition against Port Royal, in Nova Scotia. The shipping interests of Newport assumed very large proportions. In 1739 more than one hundred vessels were owned there, and its West India trade for many years was very large. At one time as many as eighteen West Indiamen were known to arrive within twenty-four hours. Several of the warships of the Revolution were of Rhode Island build. Among them were the twenty-eight-gun ship *Providence*, which was captured by the British at Charleston, South Carolina, in 1780, and the thirty-two-gun ship *Warren*, which was burned by its crew on the Penobscot, in 1779, to prevent it from falling into the hands of the British. These ships were two of the lot ordered by Congress in December, 1775, and were both launched at Providence in the following May. The *George Washington*, a 624-ton ship which was purchased by the Government in 1798 at Providence, is supposed to have been built either here or at Warren. The *General Greene*, a ship of 645 tons, which carried twenty-eight guns, was built at Warren in 1799. Another war vessel, the *Chippewa*, a fourteen-gun brig, was built at Warren in 1815.

Newport's commercial development was very marked just before the Revolution. In 1769 the port employed 200 vessels in foreign trade, and between three and four hundred in the coast trade. It then ran a regular line of packets to London, and also had many ships engaged in whaling. Newport enjoyed a bright future at this time and its inhabitants were confident that it would become the commercial metropolis of the colonies. The Revolution, however, ruined the town. It was occupied by the British throughout the greater portion of the war, and its commerce and shipbuilding ceased for the time being and never recovered from the blow, as, after peace was restored, the town's supremacy was gone and trade had been diverted to other ports.

EARLY SAWMILL HISTORY.

As was mentioned above, shipbuilding was one of the first Rhode Island manufacturing industries, but, as it was necessary first to get the lumber before the vessels could be built, it is probable that the sawmill antedated the shipyard. The sawmill was a necessity to the settler, although it is not known at just what date the first one was set up in the colony. It is probable that there was a sawmill in Newport as early as 1639, although the boards might have been made by pit sawing that are referred to in the following quotation from the "Rhode Island Colony Records":

At the Particular Courte held on the 7th of 11th, 1639.

. . . Whereas, complainte was made by the Secretarie on the behalfe of the Towne of Nieuport against Ralph Earle for his falling of timber, contrarie to order, and suitt made accordinglie in the Courte. By the Courte it was ordered, that the s'd Ralph and Mr. Willbore, his Copartner, shall serve the Towne with sufficient Stuff, Viz.: with sawn boards att eight shillings per hundred, and half inch boards, at seven shillings, to be delivered at the pitt by the water side; and clapboards and paile at twelve pence a foote, by the Stubb, sound and good sufficient merchantable ware; and further it is ordered, that the said Mr. Willbore and Ralph Earle shall not make sale of any of the Timber within ye bounds of the Towne of Nieuport, nor transport any of it (eyther whole or broken) to any other plantation without license, as they shall answere it at their perill.

The preceding year concessions were made to Nicholas Esson for the setting up of a mill. The records do not show whether this was a grist or saw mill, or both. The agreement follows:

At a Generall Meeting upon the Publicke Notice, the 16th of ye 9th, [1638]

It is ordered that John Porter and John Sanford shall treat with Mr. Nicholas Esson, and shall fully agree with him, in allowing of him sufficient accomodations for foure Cowes and planting ground as they shall think meett, all which is for the setting up of a Water Mill which the said Mr. Esson hath undertaken to build for the necessary use and good of the plantation; and further it is granted to the said Mr. Esson that he shall have liberty to fall and carry away any such timber as shall be of necessity used in the present building of the Mill.

James R. Irish published in 1877 an "Historical Sketch of Richmond from 1747 to 1876," from which the following excerpts are taken:

Grist and saw mills were a necessity to the early settlers, and, happy for them, the power to operate them was found in the streams that formed a part of their domain. How early and where the first mills in town were built, no known record shows. The small streams were larger and nearer perennial when the hills were covered with forests than now.

Probably their first mills were built along these, as dams were more cheaply constructed than on the larger streams. In the memory of some now living, many of the streams now not occupied as mill forces had their sawmills, grist mills and forging smith shops. . . .

At Arcadia, just on the line between Exeter and Richmond, there was a sawmill. The evidences are still manifest there. . .

Where now is the village of Clarke's Mills, on December 1st, 1759, Jeffrey Wilcox gave by will to his son, Abraham Wilcox, one acre of land. This was deeded by said Wilcox to Jeremiah Browning, March 8th, 1762, with a sawmill and grist mill in good running order.

No mention is made of the sawmill in any subsequent transfer. The price paid by Browning for these mills and privileges was £3,000 current money of New England. . . .

As early as 1772 a sawmill and an iron manufactory existed where Kenyon's mills are now located. . . . So more than one hundred and twenty years ago, William Sweet owned a sawmill near where David Moore now lives. A mill still exists on the site.

At Tug Hollow, and Belleville, there early existed saw and grist mills. . . .

The forests of the town have, in the years past, furnished material for commerce in the form of building material, hoop poles, wood and coal. Of the latter large quantities were made and sold while the iron works were in blast. . . . Ship timber was also cut and drawn to Westerly, and perhaps to other places.

The "History of Woonsocket," by E. Richardson, 1876, states that "The first wheel in this region [Woonsocket] that was turned by its waters [the Blackstone] was that of a sawmill, which stood where now stands the tower of the Ballou Manufacturing Company's cotton mill, near the dam. There are many now living who remember the ancient mill, but none can tell when the edifice was erected. If this could be told, the time could be nearly approximated when the ax and the plow of the pioneer first broke the solitudes of northern Rhode Island. From documentary evidence . . . I have fixed the date at about the year 1666, and the reader may dispute my conclusions at his leisure."

To quote further from Keach's "Burrillville," published in 1856:

There are several old sawmills and shingle mills not in operation. As the timber is cleared away near them, those farther in the woods do the work. Buck Hill woods, the largest tract of timber in 1855, contained 6,000 acres.

In the valley of "Meadow Brook" about half a mile from its source, was once a bark mill. Unlike the mills of our time, the bark was ground between stones and by horse power. One of these stones is now the curbstone of a well near by. The mill was small, about a hundred hides a year being tanned, besides the woodchuck and squirrel skins that the boys prepared, to make whip lashes and money purses. It is about thirty years since it was used and it gradually crumbled away, its moss grown roof falling in, and it assumed an aspect altogether interesting in the eyes of the antiquarians.

A little below the bark mill is the site of the turning lathe of Shadrach Steere. Here were made spinning wheels, the pianoforte of our industrious grandmothers. Those solid oak, high-backed chairs, still to be found in the farm houses of Burrillville and the adjoining towns, were mostly made here. Heavy old men, who would break down in the light fancy chair of modern times, were safe in the old substantial seat of the Quaker pattern. At last, hoe handles, scythe-nibs and bobbins were turned.

The early sawmills were driven both by water power and the wind. Field, in his "State of Rhode Island and Providence Plantations at the End of the Century," says: "It thus appears that the first sawmills were

run by water, but some years later windmills were introduced and they seem for a time to have displaced the water mills, both for the grinding of grain and the sawing of lumber. The first windmill in the colony was erected in Newport in 1663 by Governor Easton and his sons. It was blown down in 1675. Governor Arnold is credited with building the old stone mill for a windmill in 1676."

At a town meeting held January 27, 1678 or 79, the following privileges were granted for erecting a sawmill:

An order and grant unto Ye winde Saw-mill the owners thereof; Voted by ye towne vpon ye persentation of a bill by John Smith (Miller), Thomas Arnold, Nathainell waterman, John whipple Junr, & John Dexter, in ye behalfe of them & ye rest of there pertners, vpon ye 27th of the jnstant January; That ye above named shall have ye full & sole power of ye use of two Acars & halfe of ye Townes Comon, vpon ye hill called Lurttlebury hill, anywhere vpon ye sayd [hill], where they shall see cause to sett vp a sawmill; And to be to theire owne proper use & best, behoofe of them & their heires soe Longe as ye sayd mill shall stand, or by them be maintained, & not diserted; and not any other person of this towne to molest or disturb ye above sayd men in any respect, till such time as ye abouesayd men shall wholly Disert ye sayd mill, any order hearetofore made to ye contrary heareof not with standing: and yt ye Surveyer shall Lay out to theire use ye sayd Land and make returne thereof to ye Towne, they sattisfieing the Surveyer for his paines.

The following excepts, taken from the "Early Records of the Town of Providence," show that there was legislation governing the cutting of timber two years after the settlement of the plantation:

Agreements & ordes of the second year of ye plantation 28 die, mense 12

It was agreede yat *two men* shold be deputed to view ye Timber on *ye common* that such as haue occasion to vse timber shold repaire vnto them for their advise & consent to fell timber fitt for their vse betwene the shares graunted & mile end cove.

Item yat from ye sea or Riuer in ye west end of ye towne vnto ye Swamp in ye East *end* of ye feilds yat no person shall fell any wood or Timber, before any particular mans shares end.

Item yat any timber felled by any person liuing on ye grond aboue a yeare after ye felling shall be at ye townes disposing beging at ye 23 die of ye mony above written.

At a quarter Court held the 27 of the 11th m. 1650 (so called)

Ordered that no prson whatsoever, whether Townesman or other shall carry, or cause to be carryed (either directly or indirectly off the Comon, any ffencing-stuffe, Bolts, Pipe-staues, Clapboards, Shingles, Pitch-lights, or any other sort of building Timber, out of this Plantation, without leave from the town: and if any shall be found so doing, he or they shall forfeit to the Tow[n] for every Tune of ffencing Timber or other building timber after the rate of ten shillings ℔ Tune: for euery hundred of clapboards ten shillings; for every hundred of shingles |after| the rate of 2s 6d & for every 100 weight of Pitch wood after the rate of 3s & for |every 100 of| Pipe-staves after the rate of 10s.

At a Town Meeting, 11th day Dec., 1666

It is ordreed by this Towne that if any person, or persons shall from this day forward, sell, give, or any wayes make away out of this Towne, any Timber for Coopers vse, for Clabboards, for shingles, for pales; ffor postes or Railes for fenceing or Bolts;

being gotten upon the Common; shall fforfitt Tenn shillinges for each Tree or any part of a Tree; The which forffiture shall the one halfe goe unto the finder, and the other halfe unto the Towne:

Munday ffebruary ye 6th $170\frac{9}{10}$ the meeting is again in being by adjornmt from January ye 27th $170\frac{9}{10}$

It is ordered that no strangers or any other Person who is not interested in ye Comon of our Plantation of his owne Right shall cut downe, Carrey away or Make improvemt of any Cedar or Pine Timber, or any other sort of Timber |in our township; on the comon| unless they have a Grant from the body of ye Purchassers & Proprietors; And if any shall presume to act contrarey to this order they shall be liable to be dealt withall in a due course of law by legall Prosecution; Neither shall any Person who is intrested in the Commons of our Towne grant leave to any strangers or give them liberty to act with ye Timber on ye Towne Commons as aforesd, unless it be with ye Consent of ye body of the Purchassers & Proprietors.

On October 25, 1704, the General Assembly for the Colony of Rhode Island and Providence Plantations met at Providence and passed an act against firing the woods, owing to the destruction caused by the setting of fires in the forests. The enactment read in part as follows:

Be it therefore enacted by the Governor and Councill and House of Representatives, and by the authority thereof it is enacted, That no person or persons whatsoever shall at any time or times hereafter presume to set any fire or fires, in order to burn the woods within any the respective townships of this Collony at any other time or times, than from the 10th day of March to the 10th day of May, annually. And on neither of said months on the last day, or 7th day, or first days of any week, &c.

And be it further enacted, That if any person or persons shall be taken in so doing, on lawfull proof of their so doing, contrarie to the times before mentioned, shall be compelable by law to pay a fine of thirty shillings money; and one half thereof shall be to the complainor, and the other half to the use of the town where such fires are set. And each person receiving damage thereby, either in hay, fences or fencing stuff, coopers' stuff, clapboards, shingles, or any other estate, shall have his liberty to bring his action of trespass against the offender, and to recover damage by due course of law; any Act or Acts in this Collony, to the contrary hereto notwithstanding. Always provided, that the fines for setting the woods on fire, contrary to this Act, be taken and prosecuted as in actions under forty shillings.

STATISTICS.

The State census of 1875 showed eighty-one sawmills. They employed 123 men, whose wages amounted to $27,886, and from $71,430 worth of raw materials produced lumber valued at $163,710. Of the whole number sixty-three were driven by water power, and probably were run but a part of the year.

The United States census of 1900 showed thirty-five sawmills, planing mills attached to sawmills and timber camps in Rhode Island, with an invested capital of $216,670. The proprietors and firm members numbered thirty-eight.

The following comparative table of the principal items making up the lumber statistics is from the years 1850 to 1900, inclusive. Prior to 1850 the figures reported were too inaccurate or incomplete for comparison.

COMPARATIVE LUMBER STATISTICS, 1850-1900—RHODE ISLAND.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments.	51	26	81	49	32	35
Capital	$138,700	$66,000	$161,200	$144,250	$135,156	$216,670
Number of wage-earners	134	79	204	152	195	182
Wages	$60,252	$21,828	$39,826	$33,143	$64,697	$64,367
Cost of materials used	$142,768	$46,027	$157,079	$120,888	$116,696	$70,861
Value of products	$241,556	$76,114	$257,258	$240,579	$264,625	$233,579

[1] Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

The grand total value of forest products for 1899 amounted to $280,734, made up as follows:

FOREST PRODUCTS OF RHODE ISLAND—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
White pine	14,277,000	$155,724
HARDWOODS:		
Ash	34,000	$ 729
Birch	30,000	350
Chestnut	2,815,000	41,430
Hickory	6,000	250
Oak	1,077,000	21,716
Black walnut	10,000	280
Maple	16,000	240
Total, hardwoods	3,988,000	$64,995
Total, rough lumber	18,265,000	$220,719

SHINGLES.

	Quantity, pieces.	Value.
White pine	120,000	$ 335
Cedar	1,495,000	3,955
All hardwoods	652,000	1,866
Total, shingles	2,267,000	$6,156

COOPERAGE MATERIALS.

	Quantity.	Value.
Staves, pieces	20,000	$100

OTHER SAWED PRODUCTS.

Carriage and wagon stock, feet b. m.	263,000	$6,200
Lath, pieces	16,000	18
All other sawed products	.....	565
Total, other sawed products	.....	$6,783

TIMBER CAMP PRODUCTS.

Fence posts, pieces	13,200	$ 1,315
Logs cut for domestic sale, feet b. m.	550,000	3,850
Piles, pieces	1,110	2,655
Railway ties, pieces	51,220	14,557
Rived or shaved shingles, pieces	95,000	200
Telegraph poles, pieces	4,480	8,990
Charcoal, bushels	6,300	756
All other products	.....	11,400
Amount received for contract work	.....	2,810
Total, timber camp products	.....	$46,533
Total, planing mill products	$1,733	
Less value of lumber used	1,290	$443
Grand total, value forest products	.....	$280,734

The following comparative preliminary summary of lumber and timber products of Rhode Island shows the principal items for 1900 and 1905.

The figures for 1900 do not agree with those of preceding tables for that year. This is explained by the fact that in the schedule for 1905 the custom mills were not included; hence, for purposes of comparison, the same were deducted from the census figures of 1900.

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—RHODE ISLAND.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	23	122
Capital	$147,280	$156,141
Salaried officials, clerks, etc.:		
Number	3	[1]1
Salaries	$1,225	[1]$1,200
Wage-earners:		
Average number	205	[1]198
Wages	$68,697	$95,763
Miscellaneous expenses	$29,166	$83,091
Cost of materials used	$66,111	$100,177
Value of products	$222,083	$401,170
Quantity, Value and Principal Varieties of Rough Lumber:		
White pine:		
Thousand feet b. m.	13,435	11,095
Value	$146,395	$157,502
Chestnut:		
Thousand feet b. m.	2,457	1,713
Value	$35,230	$26,594
Oak:		
Thousand feet b. m.	1,062	2,140
Value	$21,416	$38,670
All other:		
Thousand feet b. m.	344	450
Value	$7,524	$6,050
Total quantity, thousand feet b. m.	17,298	15,398
Total value	$210,565	$228,816

[1]Decrease.

The subjoined table shows the values and, in some cases, the quantities of the forest products exported and imported, by customs districts, during the years 1856 to 1905. Earlier than the year 1856 it is impossible to go, inasmuch as the reports were inaccurate and incomplete prior to that time. Providence makes the best showing in every item, except exports of manufactured wood, in which Bristol and Warren stand first. The greatest amount of sawed lumber imported by Providence during any one year was 6,729,000 feet, in 1897, valued at $65,733; the largest importation of shingles was 8,894,000, in 1874, valued at $19,334; the greatest value of all other importations of unmanufactured wood was $69,807, in 1897, and the greatest value of importations of all manufactured wood was $21,835, in 1905. The largest export figures for Providence for any one year were as follows: Sawed lumber 458,000 feet, in 1857, valued at $7,240; shingles 331,000, in 1862, valued at $1,300; all other unmanufactured $28,909, in 1864, and all manufactured $37,931, in 1857. The corresponding import figures for Newport were as follows: Sawed lumber 2,521,000 feet, in 1896, valued at $23,276; shingles 3,697,000, in 1900, valued at $8,328; all other unmanufactured $15,616, in 1897, and all manufactured $9,303, in 1902. Newport's largest exports were: Sawed lumber 235,000 feet, in 1860, valued at $3,829; shingles 55,000, in 1893, valued at $220; all other

unmanufactured $7,388, in 1865, and all manufactured $13,309, in 1857. The largest import figures for Bristol and Warren were as follows: Sawed lumber 398,000 feet, in 1897, valued at $3,333; shingles 800,000, in 1900, valued at $1,600; all other unmanufactured $1,736, in 1897. Following are the export figures for Bristol and Warren: Sawed lumber 157,000 feet, in 1856, valued at $2,688; shingles 37,000, in 1861 (the only year in which shingles appear in the records), valued at $140; all other unmanufactured $19,507, in 1865, and all manufactured $28,150, in 1856.

The table of the imports and exports of Rhode Island ports is as follows:

IMPORTS AND EXPORTS OF RHODE ISLAND PORTS, 1856-1905.

Commodities.	Providence.	Newport.	Bristol and Warren.	Total, Rhode Island.
Imports:				
Sawed lumber, feet	62,625,000	17,546,000	2,489,000	82,660,000
Sawed lumber, value	$539,722	$146,135	$ 23,435	$709,292
Shingles, pieces	110,867,000	20,304,000	1,761,000	132,932,000
Shingles, value	$233,435	$45,194	$3,544	$282,173
All other unmanufactured, value	$544,244	$57,815	$4,452	$606,511
All manufactured, value[1]	$233,094	$36,707	.....	$269,801
Exports:				
Sawed lumber, feet	2,089,000	886,000	400,000	3,375,000
Sawed lumber, value	$40,258	$17,049	$8,123	$65,430
Shingles, pieces	1,308,000	81,000	37,000	1,426,000
Shingles, value	$5,759	$272	$140	$6,171
All other unmanufactured, value	$53,345	$28,994	$52,528	$134,867
All manufactured, value	$183,407	$59,701	$193,245	$436,353

[1]For the years 1869 and 1870, for both Providence and Newport imports, the figures under "All manufactured, value" include all wood and manufactures of except cabinet wood.

CHAPTER XX.

NEW YORK—EARLY HISTORY.

The Empire State of the Union, for a century the greatest in wealth and population and with a history which reaches back almost to the earliest dates of European occupation of that part of America north of the Gulf of Mexico, occupies a somewhat peculiar place in respect to its political history. It was almost untouched by the early explorers. It is thought by some that John Cabot, on his voyage of 1498, may have seen New York Bay; certain it seems to be that Verrazani, in 1524, anchored therein. But it was not until 1609 that Hudson, seeking the northwest passage to India, defeated in the North by ice and running down the coast, on September 3 anchored within Sandy Hook. A week later he sailed through the Narrows and anchored in the inner harbor, then for ten days explored the Hudson, sailing the *Half Moon* up the river beyond the site of Hudson, while a boat went a little above Albany. In the same year Champlain made his famous expedition into New York, and in July discovered Lake Champlain. Thus the English possessions in New England were surrounded by alien territory.

The following year certain Amsterdam merchants, stimulated by Hudson's account of his discovery, engaged in a profitable trading venture. Others followed, and by 1614 a settlement of four houses had been made on the Island of Manhattan, some small forts had been built on the river, there was a settlement at Albany, and the process of exploration and establishment of trade relations with the Indians was under full headway.

Opportunity for the French in the North came in the practically undisputed possession of the St. Lawrence, but the opportunity for the Netherlands came in the split in the original Virginia Company. The London Company, also called the Virginia Company, was granted jurisdiction from 34 degrees to 38 degrees north latitude, while the Plymouth Company had jurisdiction from 41 degrees to 45 degrees; the intervening territory was to go to either of the two companies which should first plant a self-supporting colony within it. But the London Company was interested in its Virginia projects, and the Plymouth Company had its eyes fixed on the New England Coast; so between them, on the basis of actual discovery and prior settlement, the Dutch set up their claim and New Netherlands came into existence, with settlements about the mouth of the Hudson and at and near Albany, and with claims which embraced New Jersey,

Long Island, the coast of Connecticut, the Connecticut River and an indefinite extent westward in what is now New York.

Adriaen Bloch, who carried on explorations in 1612–13–14 and for whom Block Island was named, secured a charter for the "New Netherlands Company," which expired in 1621. In that year the Dutch West India Company came into existence, with a charter granted by the States General of Holland. It was permitted to appoint governors and other officers, to administer justice, to make treaties and to enact laws. Its first packet, the *New Netherland*, in May, 1624, brought over thirty families, eighteen of whom established a settlement at Fort Orange, near Albany. In 1628, the company promised to give to every person who sent over a colony of fifty souls above the age of fifteen years the title of "Patroon" and the privilege of selecting tracts of land, except on Manhattan Island, extending eight miles along the river and as far inland as he pleased. The rapid growth in power of the patroons gave rise to political questions which did much to weaken the Dutch power. In 1640, the first English settlers on present New York soil came to Long Island from Connecticut. The English encroachments led to the treaty of 1650, when Greenwich, on the mainland, and Oyster Bay, on Long Island, were fixed as the points dividing English and Dutch territory. This treaty was made with the united colonies of Massachusetts, Plymouth, New Haven and Connecticut (United Colonies of New England), but in a few years boundaries were again in dispute.

The purpose of this history does not require any detailed account of the political events of that time. It is enough to say that on March 12, 1664, Charles II, of England, issued to the Duke of York a patent granting him all the islands between Cape Cod and the Narrows, the Hudson River and the lands from the west side of the Connecticut to the east side of Delaware Bay, together with the islands of Marthas Vineyard and Nantucket. The inland boundary was a line from the head of Connecticut River to the source of the Hudson River, thence to the head of Mohawk River and thence to the east side of Delāware Bay. This patent disregarded the Connecticut patent issued to John Winthrop in 1662, but the ensuing dispute was eventually settled by agreement between the provinces concerned by fixing the boundary between New York, on the west, and Connecticut and Massachusetts, on the east, at a line drawn twenty miles east of the Hudson.

A naval and military expedition was organized which sailed from Portsmouth, England, in May, 1664, and, reinforced by militia from the New England colonies and Long Island, the capitulation of the Dutch was effected August 29. The city of New Amsterdam, which had a population not exceeding 1,500, was renamed New York, and a force sent

up the Hudson took possession of Fort Orange, the name of which was changed to Albany. In 1673 the city and province were recovered by the Dutch, but were restored to England by the treaty of Westminster in 1674. From that time until the American Revolution that portion of New York tributary to the Hudson, together with Long Island, was continuously under English rule. In 1678 Governor Andros described the province as containing twenty-four towns or villages with twenty churches, the number of men capable of bearing arms at 2,000 and the value of estates at £150,000. During the period from 1678 to 1696, the population of New York City had nearly doubled, reaching 6,000, and that of the province had increased to nearly 30,000.

The line of division between New York and Pennsylvania was fixed by the Duke of York before he actually took possession of the New Netherlands when he executed deeds to Lord John Berkeley and Sir George Carteret, granting to them all that portion of his territory to the "westward of Long Island and Manhitas Island, and bounded on the east part by the main sea, and part by Hudson's river, and hath upon the west, Delaware Bay or river, and extending southward to the main ocean as far as Cape May, at the mouth of Delaware Bay; and to the northward, as far as the northernmost branch of the said bay or river of Delaware, which is 41 degrees 41 minutes of latitude, and crosseth over thence in a straight line to Hudson's river, in 41 degrees of latitude." This accounts for the peculiar northwest and southeast direction of the New Jersey northern boundary. The boundary between New York and Pennsylvania was long in dispute. Penn's original grant of 1681 gave him the territory north to 43 degrees of north latitude, which would have brought the northern boundary of Pennsylvania, and, consequently, the southern boundary of New York, to a line passing just south of Saratoga Springs, Herkimer, Syracuse and Niagara Falls. The original Connecticut charter, if applied to the soil, would have given that colony nearly two-fifths of the northern part of the present State of Pennsylvania. In the end, Connecticut largely relinquished its claims, and Pennsylvania withdrew its northern boundary to 42 degrees north latitude, as at present. Nevertheless, there was constant conflict between the Connecticut settlers and Pennsylvania over the contested territory. Finally, in 1781, when the Articles of Confederation were put in force, the matter was referred to a court, which, about the beginning of 1783, outlined the southern and western New York boundaries as they are at present.

We have mentioned the settlement of the dispute between Connecticut and Massachusetts and New York. New York, by the charter of Charles II, claimed all of what is now Vermont. This was resisted by New Hampshire, as has been related in connection with that State, but without avail;

and it was not until after the adoption of the Constitution that Vermont was formally separated from New York, the northeastern boundary of which was established substantially on the basis of a northern extension of the old Connecticut-Massachusetts western line and by the extension westward of the northern Vermont boundary. The northern boundary of New York was finally and definitely settled, as between that State and Canada, by the Ashburton treaty of 1842.

Within New York, as finally outlined, there were 47,687 square miles of land area, or 30,519,680 acres. This area was originally forest covered throughout its entire extent, and when the white race took possession it found this condition prevailing except where some of the Indian tribes, belonging to the Six Nations, had cleared small areas near their villages for raising corn or, in some places, especially on the east side of the Hudson, where there were openings caused by forest fires started by the Indians in order to facilitate hunting. But these clearings formed an insignificant portion of the entire area, which is abundantly allowed for if we say that the wooded area of New York at the beginning of lumbering was 47,000 square miles.

It was essentially a white pine state, for this magnificent tree grew in almost every main division and, in some, almost to the exclusion of other species. Pine Street, in New York City, is said to have received its name from the fine white pines which grew on the farm of Jan Jansen Damen. Early visitors, like Peter Kalm, the Swedish naturalist, who visited Albany in 1749, found quantities of this timber along the Hudson. Michaux said that the shores of Lake Champlain were most abundantly peopled with the species; in fact, it seems to have been the leading tree almost everywhere except in the northwestern part of the State, south of Lake Ontario, which was essentially a hardwood district, although pines were also found. Spruce, chiefly in the Adirondacks, and hemlock, most numerous toward the west along the Pennsylvania line, were also prominent features of the forest landscape, although their value was not appreciated until within the last generation.

EARLY SAWMILLS.

It is indicative of the part which lumbermen of the State of New York played in the early history of the lumber industry of this country, that as long ago as 1865 lumber had passed its zenith in that State and was a declining industry. In Michigan, at that time, the white pine business was still in process of development. Wisconsin's great timber lands in the middle West had only in isolated portions heard the ring of the woodsman's ax or felt the presence of the timber cruiser.

New York's lumber history goes back nearly three centuries. The first houses were built on Manhattan Island in 1614, and houses were

erected at Albany in the same year. The erection of these structures, however, does not mark the real beginning of the lumber industry in New York State. True, the materials were hewed out of the forests, but the real beginning of lumbering in any locality was marked by the erection of the first sawmill, which made lumbering one of the occupations and part of the life of the community. So far as may be ascertained, it was not until 1623 that the first sawmill was erected in New York State. In that year the Dutch West India Company built three sawmills and began in real earnest to cut timber in the newly discovered territory. One of the mills was erected on what is now Governor's Island, while another gave name to Saw Mill Creek, a tributary of the East River. The machinery for the mills was brought from Holland, and the motive power was undoubtedly either wind or water. The mill on Governor's Island was still in existence in 1639, for there is a record of its lease in that year, the annual rental being payable in 500 merchantable boards, one-half of them oak and the other half pine.

The mills of Fort Orange, or Albany, may have slightly antedated the New Amsterdam mills. History records the arrival there from Holland of Andries Corstiensen, a millwright, and two sawyers in 1630. In the same year Lawrenssen and Barent Tomassen, sawyers, located at Troy, then known as Rensselaerwyck. In 1645, Barent Pieters Koeymans, who had settled in the colony in 1636, took charge of the patroon's sawmill. In two years he made one mill cut over 4,000 boards. Koeymans may be said to be the father of the lumber industry in New York. This busy man stands as the most conspicuous figure in the early lumber history of that State. He was not a makeshift lumberman, but a lumberman by choice and profession, and one who had the confidence to go ahead with lumbering operations at a time when conditions were far different from those which prevail now. Cruyn Cornelissen and Hans Jansen had erected sawmills twelve miles south of Albany in 1651, and in 1673, Koeymans bought a large tract of land in that vicinity for lumbering purposes. Here afterward sprang up the town of Coeymans.

In the Seventeenth Century the Hudson Valley was quite rapidly peopled by colonists and the accompanying lumbermen. Frank Pieters Clavers built a sawmill within the boundaries of the present town of Kinderhook, Columbia County, in 1661. The stream on which it was erected has ever since been known as the Saw Kill. Jan Barentson Wemp built a sawmill in 1663 on the Poesten Kill, which joins the Hudson at Troy. As early as 1701 there were forty mills in the Province of New York.

The primary object of these early mills was to supply lumber to the colonists who were building homes for themselves in the forests of New

York State. This trade, however, was not sufficient to render the business entirely profitable and the early lumbermen naturally turned to the old country for a market. At that time there was not a single sawmill in operation in Great Britain and the Empire furnished a market for considerable of the American lumber. Some was also sent to Holland. Lumber and furs were the first exports from America to Europe. Within three years after the first immigrants had arrived to join those who had already founded a colony on the American shore, a shipload of lumber was exported to Holland. It was mostly oak and hickory. In 1675 a cargo of timber valued at £400 was sent from New York to England.

It will be seen therefore that the "export business" had much to do with developing the lumber industry in the Province of New York.

Following the establishment of the mills at New Amsterdam in 1633 and Fort Orange in 1651, the lumber industry gradually developed throughout the entire territory now comprised within the State of New York. It should be borne in mind that where reference herein to a locality is made the present name is given of the division in which that territory now belongs. It will be necessary to refer to various parts of New York State by county names, although those counties were not in existence at the time the events here chronicled occurred.

The first mill erected in Suffolk County was built in 1659 in the town of Riverhead by John Tucker, who in the same year erected another mill in what is now the town of Southold. The next early New York mill was the Jan Barentson Wemp mill, at Troy, to which reference has already been made. The mill erected in Kinderhook, Columbia County, in 1665, by Frank Pieters Clavers has also been mentioned. William Saxton erected a mill within the confines of what is now Scarsdale, Westchester County, in 1668. The first mill in the present Richmond County was erected in 1669 by John Palmer on the site of the town of Castleton Corners.

The following shows the year in which the first sawmill was erected in the territories now embraced in the counties named, the site of the mills as to the present townships being also given:

First Settlement.	First Sawmill.	Built by.	Town.	County.
1614	1633	West India Company.	Manhattan.	New York.
1673	1651	Hans Jansen.	Coeymans.	Albany.
1630	1654	Jacob Janse Flodder.	Albany.	Albany.
1690	1659	John Tucker.	Riverhead.	Suffolk.
1640	1659	John Tucker.	Southold.	Suffolk.
1659	1663	Jan Barentson Wemp.	Troy.	Rensselaer.
1661	1665	Frank Pieters Clavers.	Kinderhook.	Columbia.
1701	1668	William Saxton.	Scarsdale.	Westchester.
1640	1669	John Palmer.	Castleton Corners.	Richmond.

First Settlement.	First Sawmill.	Built by.	Town.	County.
1653	1673	Henry Townsend	Oyster Bay	Queens.
1656	1675	Joseph Carpenter	Jamaica	Queens.
1650	1684	Dirk Tennisse Van Vechten.	Catskill	Greene.
....	[1]1684	.....	.....	Schenectady.
1653	1688	Jonathan Rogers	Huntington	Suffolk.
1688	1703	.....	Rochester	Ulster.
1708	1710	Robert Livingston	Livingston	Columbia.
1685	1728	Samuel Hazard	New Windsor	Orange.
1728	1730	Manuel Gonsaulus	Mamakating	Sullivan.
1730	1740	Col. Jonathan Crane	Southeast	Putnam.
1750	1740	———Fox	Minden	Montgomery.
1700	1740	Jacob Rutsen	Rhinebeck	Dutchess.
1716	1742	Sir William Johnson	Amsterdam	Montgomery.
1695	1750	Casparus Bronk	Coxsackie	Greene.
1710	1750	Philip Frederick	Florida	Montgomery.
1739	1750	———Kellogg	Carmel	Putnam.
1740	1751	Johannes Snyder	Crawford	Orange.
1749	1751	Father Picquet	Ogdensburg	St. Lawrence.
1750	1755	Jacob Weidman	Berne	Albany.
1700	1760	Uziah Conger	New Scotland	Albany.
1719	1760	Daniel Burt	Warwick	Orange.
1738	1760	Isaac Finch	Wawayanda	Orange.
1763	1760	John Moore	Tusten	Sullivan.
1730	1762	Col. Beverly Robinson	Phillipstown	Putnam.
1760	1762	Sir Wm. Johnson	Johnstown	Fulton.
1690	1762	.....	Half Moon	Saratoga.
1762	1764	Moses Clements	Queensbury	Warren.
1740	1765	Lemuel Winchell	Olive	Ulster.
1761	1766	Col. Philip Skene	Whitehall	Washington.
1765	1767	William Gilliland	Willsboro	Essex.
1722	1768	Robert Milliken	Montgomery	Orange.
1762	1768	Nathan Tefft	Easton	Washington.
1764	1768	Albert Baker	Kingsbury	Washington.
1765	1769	Count de Freydenburgh	Plattsburg	Clinton.
1770	1770	Col. Hendrick Frey	Canajoharie	Montgomery
1769	1772	Fox & Huntington	Ticonderoga	Essex.
1754	1773	William Hynds	Seward	Schoharie.
1761	1773	Sir William Johnson	Mayfield	Fulton.
1766	1773	Daniel Rose	Greenwich	Washington.
1750	1774	Christian Brown	Cobleskill	Schoharie.
1766	1774	Col. William B. Whiting	Canaan	Columbia.
1700	1775	Shaker Colony	Watervliet	Albany.
1762	1775	Garret Staats	Springfield	Otsego.
1775	1775	Alexander McCollum	Middlefield	Otsego.
1767	1776	———Carpenter	Wallkill	Orange.
1775	1776	Abraham Van Horne	Stark	Herkimer.

[1]Some time prior to this date.

First Settlement.	First Sawmill.	Built by.	Town	County.
1775	1777	———Munroe	Northumberland	Saratoga.
1765	1780	Amos Sweet	Berlin	Rensselaer.
1772	1780	James Hallock	Marlboro	Ulster.
1773	1780	Ezekiel Johnson	Kortright	Delaware.
1754	1783	Elisha Cole	Kent	Putnam.
1770	1783	Jared Smith	Durham	Greene.
1771	1783	Zimmer & Becker	Wright	Schoharie.
1774	1783	John Rogers	Charlton	Saratoga.
1783	1783	Capt. A. Cuddeback	Forestburg	Sullivan.
1709	1784	Capt. Thomas Machin	Newburg	Orange.
1771	1784	John Hutt	Sharon	Schoharie.
1774	1784	John Laing	Wilton	Saratoga
1783	1784	Daniel Ross	Essex	Essex.
1737	1785	Judah Burton	Charleston	Montgomery.
1740	1785	Isaac Post	Putnam Valley	Putnam.
1775	1786	———Corey	Providence	Saratoga.
1780	1786	Jesse Dickinson	Tompkins	Delaware.
1772	1787	Nathaniel Spring	Granville	Washington.
1789	1787	Lieut. Pliny Moore	Champlain	Clinton.
1781	1788	Jacob Van Wormer	Fort Ann	Washington.
1784	1788	Henry French	Chenango	Broome.
1787	1788	Captain Casey	Manchester	Oneida.
1650	1789	George Phillips	Smithtown	Suffolk.
1784	1789	Gershem Morehouse	Greenfield Center	Saratoga.
1705	1790	Peter Quackenboss	Glen	Montgomery.
1763	1790	Benjamin Akerly	Middletown	Delaware.
1765	1790	Hercules Rice	Whitecreek	Washington.
1772	1790	———Carr	Sidney	Delaware.
1774	1790	William Rose	Colchester	Delaware.
1784	1790	John Thurman	Johnsburg	Warren.
1785	1790	Cornelius Van Allen	Garoga	Fulton.
1785	1790	Timothy Hosmer	Avon	Livingston.
1786	1790	Major William Wynkoop	Chemung	Chemung.
1786	1790	Jonathan Dean	Westmoreland	Oneida.
1789	1790	General Fellows	East Bloomfield	Ontario.
1789	1790	Jabez Mead	Chester	Warren.
1789	1790	Dr. Caleb Benton	Benton	Yates.
1790	1790	Job Vail	New Berlin	Chenango.
1790	1790	Arthur Noble	Wilmurt	Herkimer.
1790	1790	John G. Moyer	Sullivan	Madison.
1766	1791	Solomon Taylor	Sandlake	Rensselaer.
1783	1791	Delane & Hazard	Hadley	Saratoga.
1787	1791	Nathan Dean	Sanford	Broome.
1788	1791	Phineas Bowers	Catharine	Schuyler.
1789	1791	Silas Crippen	Worcester	Otsego.
1770	1792	Matthew Cully	Milford	Otsego.
1780	1792	Aaron Pierce	Fremont	Sullivan.

First Settlement.	First Sawmill.	Built by.	Town.	County.
1785	1792	Robert Harper	Colesville	Broome.
1786	1792	Daniel Prentice	Davenport	Delaware.
1788	1792	Arnold Potter	Potter	Yates.
1789	1792	Ebenezer Allen	Leicester	Livingston.
1789	1792	Asa Danforth	Dewitt	Onondaga.
1789	1792	E. & J. Boughton	Victor	Ontario.
1789	1792	Major Wm. Ransom	Tioga	Tioga.
1790	1792	Clark & Metcalf	Naples	Ontario.
1792	1792	Amable Foucher	Massena	St. Lawrence.
1786	1793	Capt. David Hinman	Norway	Herkimer.
1787	1793	Turner Fenner	Onondaga	Onondaga.
1787	1793	P. B. Wisner	Seneca	Ontario.
1788	1793	Ichabod Patterson	Corning	Steuben.
1790	1793	Elijah Phillips	Manlius	Onondaga.
1790	1793	Eleazer Lindley	Lindley	Steuben.
1791	1793	Benjamin Bowen	Newport	Herkimer.
1791	1793	George Goodhue	Addison	Steuben.
1793	1793	Benjamin Wilson	Willet	Cortland.
1793	1793	Henry W. Bond	Madison	Madison.
1793	1793	Chas. Williamson	Bath	Steuben.
1724	1794	James Jenkins	Gardiner	Ulster.
1775	1794	John Hollister	Frankfort	Herkimer.
1784	1794	Jonathan Vowers	Warrensburg	Warren.
1791	1794	Job Vail	Columbus	Chenango.
1791	1794	Stockbridge Indians	Stockbridge	Madison.
1791	1794	Griswold & Wells	Broome	Schoharie.
1793	1794	John Lincklaen	Cazenovia	Madison.
1740	1795	John Suffern	Ramapo	Rockland.
1749	1795	William A. Thompson	Thompson	Sullivan.
1763	1795	Lobdell & Baker	Westerlo	Albany.
1783	1795	Laban Andrews	Jewett	Greene.
1785	1795	Bethias Du Bois	Vestal	Broome.
1787	1795	William Miller	Bigflats	Chemung.
1787	1795	Wilhelmus Mynderse	Seneca Falls	Seneca.
1788	1795	William A. Thompson	Fallsburg	Sullivan.
1789	1795	Smith Bros	Farmington	Ontario.
1789	1795	Seth Dean	Phelps	Ontario.
1789	1795	Thomas Morris	Richmond	Ontario.
1789	1795	Gamaliel Wilder	South Bristol	Ontario.
1789	1795	Daniel Brown	Jerusalem	Yates.
1790	1795	Joseph Warn	Stamford	Delaware.
1790	1795	George Scriba	Constantia	Oswego.
1790	1795	Reuben Smith	Hector	Schuyler.
1790	1795	Joel Foster	Palmyra	Wayne.
1791	1795	James Sherman	Lafayette	Onondaga.
1792	1795	Conrad Sharp	Green	Chenango.
1792	1795	Joseph Walker	Winfield	Herkimer.

First Settlement.	First Sawmill.	Built by.	Town.	County.
1792	1795	———Higby	Livonia	Livingston.
1792	1795	George Hornell	Hornellsville	Steuben.
1793	1795	Joshua Leland	Eaton	Madison.
1793	1795	T. Cassaty	Augusta	Oneida.
1793	1795	Jotham Houghton	Maryland	Otsego.
1793	1795	Frederick Bartles	Bradford	Steuben.
1793	1795	John Shether	Urbana	Steuben.
1793	1795	Asahel Stone, Junior	Italy	Yates.
1794	1795	Bela Butterfield	Leyden	Lewis.
1795	1795	———Foster	Lake Pleasant	Hamilton.
1788	1796	Rueben Thayer	Lima	Livingston.
1790	1796	David Smith	Lee	Oneida.
1790	1796	Artemas Howe	Westford	Otsego.
1791	1796	Edward Edwards	Lisle	Broome.
1791	1796	David Atwater	Ulysses	Tompkins.
1792	1796	Pratt & Smith	Pompey Hill	Onondaga.
1793	1796	Jedediah Sanger	Skaneateles	Onondaga.
1793	1796	———Goodell	Volney	Oswego.
1794	1796	William Gray	Fort Covington	Franklin.
1794	1796	Bradley & Rice	Marcellus	Onondaga.
1794	1796	Stephen Judd	Jefferson	Schoharie.
1795	1796	Nathaniel Shaler	West Turin	Lewis.
1795	1796	David Scholl	North Dansville	Livingston.
1795	1796	Holland Land Company	Boonville	Oneida.
1786	1797	Nathan Lane	Windsor	Broome.
1788	1797	Elisha Pease	Fenton	Broome.
1789	1797	Samuel Bear	Fayette	Seneca.
1792	1797	Benjamin Hinman	Russia	Herkimer.
1793	1797	William Stevens	Elbridge	Onondaga.
1795	1797	Dumond & Yaple	Danby	Tompkins.
1796	1797	David Mallory	Chateaugay	Franklin.
1796	1797	Nathan Ford	Oswegatchie	St. Lawrence.
1797	1797	Lyman Ellis	Ellisburg	Jefferson.
1788	1798	Col. Abraham Miller	Southport	Chemung.
1789	1798	Ebenezer Curtis	West Bloomfield	Ontario.
1790	1798	Prentice Palmer	Throop	Cayuga.
1794	1798	———Van Buren	Summit	Schoharie.
1795	1798	Henry Ludlow	McDonough	Chenango.
1796	1798	William Mallory	Jay	Essex.
1796	1798	Jesse Curtis	Camden	Oneida.
1797	1798	Daniel Kelley	Lowville	Lewis.
1730	1799	Samuel Haupt	Danube	Herkimer.
1779	1799	Peake & Ward	Hamden	Delaware.
1786	1799	Josiah Litchfield	Grafton	Rensselaer.
1790	1799	Capt. Charles Brodhead	Liberty	Sullivan.
1792	1799	Joseph Bushnell	Masonville	Delaware.
1797	1799	Joel Mix	Champion	Jefferson.

First Settlement	First Sawmill.	Built by.	Town.	County.
1797	1799	Eleazer House	Turin	Lewis.
1710	1800	Hendrick Schoonmaker	Saugerties	Ulster.
1750	1800	Nathaniel Holmes	Greenville	Greene.
1765	1800	———Younglove	Stephentown	Rensselaer.
1780	1800	Andrew Garrison.	Plattekill	Ulster.
1784	1800	Oliver Peake.	Delhi.	Delaware.
1785	1800	Charles Titus	New Baltimore	Greene.
1788	1800	Isaac Baldwin.	Ashland	Chemung.
1789	1800	Amos Crary	Knox	Albany.
1789	1800	John Perrine.	Lyons.	Wayne.
1794	1800	Jeremiah Clark.	Nelson	Madison.
1794	1800	Thomas Miles.	Fabius	Onondaga.
1794	1800	Edmund Hobart	Spencer	Tioga.
1795	1800	Isaac Swartwood.	Vanetten	Chemung.
1795	1800	Gen. John Cantine.	Caroline	Tompkins.
1795	1800	Captain Williamson.	Sodus.	Wayne.
1797	1800	Ruloff Whiting.	Dryden.	Tompkins.
1798	1800	John Cryder	Independence	Allegany.
1799	1800	Governor John Brown	Webb	Herkimer.
1799	1800	Gen. Jacob Brown.	Brownville.	Jefferson.
1799	1800	Joel Jenks	Lewis	Lewis.
1801	1801	Joseph Ellicott.	Batavia.	Genesee.
1801	1801	Daniel Penfield.	Penfield.	Monroe.
1801	1803	Nathaniel Dyke.	Wellsville.	Allegany.
1802	1803	Philip Church.	Angelica.	Allegany.
1804	1803	David Eddy.	East Hamburg.	Erie.
1797	1804	Abel Cleveland.	Hanover.	Chautauqua.
1775	1805	———Teal.	Veteran.	Chemung.
1809	1805	Holland Land Company	Ridgway	Orleans.
1804	1806	William Vary.	Sheldon.	Wyoming.
1800	1806	Joseph Hewett.	Cambria.	Niagara.
1804	1807	Shepard & Thrall.	Olean.	Cattaraugus.

In the Seventeenth Century there were nearly twenty sawmills erected in the State of New York, and previous to the year 1800 there had been more than 200 more put into operation. The sawmill built in what is now the town of Coeymans by Hans Jansen in 1651 was built before there was any settlement. It is related that the first deaths in Burns, Allegany County, were those of Jeremiah Gregory, who was killed by a falling tree, April 4, 1812, and his twin brother, who was killed in the same manner September 17 of the same year. The mill erected by the Quaker colony in the town of South Valley, Cattaraugus County, did work for the white settlers on the usual terms, they furnishing the timber, and for the Indians free. In 1804 James Perkins built the first frame house in Conquest, Cayuga County, sawing out all the lumber with a whipsaw. The building

stood until 1859. Major William Winkopp built the first frame house in Chemung County, sawing out the boards and timber with a whipsaw. The mill built at Tompkins, Delaware County, by Jesse Dickinson in 1786 was carried away by the famous "punkin" flood[2] in the Susquehanna and its tributaries in the fall of 1787. The French troops, while engaged in the construction of Fort Carillon at Ticonderoga, in 1755, built a sawmill at the outlet of Trout Brook, but it was soon destroyed. The first death in the town of Vienna, Oneida County, was that of Alexander Graves, who was killed in a sawmill in 1801. The town of Oyster Bay, Queens County, in 1673 gave to Henry Townsend and his heirs forever, in consideration for a sawmill which Townsend built, "the right to cut and use timber from any part of the town he should choose, also the right to sell such timber either in the town or out of it." It is known that there were sawmills in what is now Schenectady County before 1684. Jonathan Rogers was given permission in 1688 to build a sawmill at Cold Spring on condition that he furnish lumber at a certain price, "and deliver up stream when the town wants it for a grist mill." There is no record of any mill in the town of Newark Valley, Tioga County, previous to 1830, when Patterson & Day erected a similar mill.

EARLY LUMBERING METHODS.

The early sawmills in New York were very simple in construction, the most common form being an upright saw, power for which was furnished by an overshot water wheel. Eventually, another saw was added, to be operated at the same time by the same power, and this suggested what is now the modern gang saw. The first gang mill on the Hudson River was built at Fort Edward, and this was the first in the State. The one erected by Hinckley & Ballou on West Canada Creek in the town of Russia, Herkimer County, was built in 1848. Other gangs were already in operation at Glens Falls, Sandy Hill and Painted Post. In 1848 Henry S. Shedd and Marshall Shedd, Junior, built a gang mill in Lewis County at the lower falls of the Moose River. Morgan Rosekrans and Adsit built a gang mill on the Raquette River at Norwood in 1851.

Water power was used by the early mills almost exclusively, as it was readily available. There are some gang mills in New York which use this power to this day. Thirty or forty years ago there were numerous mills in New York State operating by water power and cutting 15,000,000 feet a year each. In fact, this kind of mill was typical.

Among the earliest of the steam mills was that built in 1830 at Newark Valley, Tioga County. The engine was of the walking beam type. George Kirby built a steam sawmill at Nichols, Tioga County, in 1833. Other

[2] In this flood the cornfields were swept bare, and the yellow pumpkins that thickly dotted the surface of the swollen streams were so conspicuous that the name "punkin flood" survives among the household words in southern New York.

early steam mills were the following: Dexter & Davis at Caton, Steuben County, 1842; James E. Lyon, Hammond, St. Lawrence County, 1844; Col. L. S. Payne, Tonawanda, Erie County, 1847; Kitto & Broadway, Denmark, Lewis County, 1849. Even as late as 1865 three-quarters of the mills in New York State, it is said, were equipped with only one saw each and cut only 100,000 feet of lumber a year. This was when the lumber business was at its height.

There were in 1865 in the State 3,963 sawmills. In 1880 this number had decreased to 2,822, representing an invested capital of $13,230,934, employing 17,509 men and paying out each year $2,162,972 in wages. These mills turned out in 1880 1,148,220 feet board measure, besides lath, shingles and staves. For the next twenty years the decrease was rapid, as the timber supply became exhausted. In 1899 there were 1,742 mills, cutting 874,754 feet; in 1904, the merchant mills product was only 581,976 feet. The production is now largely confined to the Adirondack region and it is said there are not over 150 mills in the State with an actual output of more than 100,000 feet.

TIMBER AND LOGGING.

New York was a white pine State and the timber was of a fine quality, averaging 130 to 160 feet in height, with an occasional giant 250 feet tall and eighty inches in diameter. There was some hemlock, but this was generally distributed over the State and had been wasted by tanners before its value for lumber was appreciated. The Catskill region was covered with pine and hemlock, while the spruce and white cedar were confined almost entirely to the Adirondack region. The hardwoods were found in all sections. New York will go into history, however, as a white pine State. That was the wood which was first utilized by the pioneers and was the first manufactured by the early sawmills. It has now disappeared and is comparatively little more than a memory. People of New York are fully entitled to believe that none of the northern conifers have exceeded it in grain, strength, color or clearness.

In no state have the rivers played a greater part in the development of the lumber industry than in New York. The very earliest lumbermen did not utilize the excellent rivers of the State. They located their mills in the heart of the timber, and then cut circles about them. When one tract had been exhausted, the mill was moved to a new scene of operations, while logging by water was an unknown art. In fact, the rivers were used first to get the product to market instead of getting the raw material to the mill. The Fox brothers were the pioneer loggers of New York. They had a mill in Warren County and originated the idea of floating the logs to the mill instead of moving the mill to the logs. They sent the first log drive down the Schroon, a branch of the Upper Hudson.

SECOND GROWTH ADIRONDACK WHITE PINE

TREES FIFTY TO SIXTY YEARS OLD. SARANAC LAKE

There were no railroads or canals. Such lumber as was not used by local consumers had to be got to market by some other method. The cheapest and simplest way was rafting the lumber to the larger towns. It is interesting to note that the first lumber sawed in Arthur Noble's mill in Herkimer County in 1790 was consigned to Ireland. It was rafted down West Canada Creek, thence down the Mohawk to the falls at Cohoes; then taken by wagon to Albany and loaded into sloops for transfer across the Atlantic. Edward Edwards built a sawmill on the Onondaga, in Broome County in 1796 and ran the first raft on the Chenango River. Jesse Dickinson ran the first raft down the west branch of the Delaware River about 1788. This lumber was floated clear to Philadelphia. Lumber was rafted out of the Conewango into the Upper Allegheny and finally to Pittsburg. In fact, every river in the State was used by the lumbermen annually for floating lumber to market, and it was some time after the advent of the railroad before this method of transportation became obsolete. The lumber raft passed out of use about 1880. The custom on the Hudson was to raft lumber to Albany and there load it in sailing vessels bound for New York or across the ocean, although, as elsewhere stated, in early days a good many small rafts supplied lumber to yards on the lower Hudson, and were floated even as far as New York City.

LUMBER RAFTING METHODS.

The method of rafting was simple. The pine and hemlock were laid from twenty-four to thirty courses deep, several courses projecting above the surface of the water. Each course was laid at right angles to the preceding one, and this served to hold the lumber together. As most of the lumber was in sixteen-foot lengths, the lumber squares thus formed measured sixteen feet on each edge. These were made into a raft. The customary size of a raft was 148 feet in width and 160 feet long. A raft of this size, containing twenty-five courses, would include 180,000 feet of lumber or more. In addition, a deck load of shingles or dressed lumber was often taken along for sale at some market en route. The rafting crew lived on the raft, in rough shanties erected for the purpose. Three oars on each side of the raft permitted it to be handled in the river. The crew included twelve or eighteen men. When there was good water a raft would make from forty to fifty miles a day, tying up at the bank at night. This method of handling lumber developed a peculiar craft, that of the raftsman, and the men attained much skill in avoiding shallows and collisions with bridge piers. The pioneer lumbermen claim that rafted lumber was better than lumber conveyed overland, as the immersion in the river removed much of the sap. It must be admitted, however, that it also took up a great deal of mud and dirt on the way. When the lumber reached the planing mill it carried an amount of grit which made considerable trouble

for the filers. Hewed timber was conveyed in this way also and in some parts of the East it is still stored in booms, awaiting sale.

Actual log driving was begun by Norman and Alanson Fox in 1813 on the upper Hudson and soon became the method of transportation in all that country. The sorting was a natural outgrowth and in 1849 the Hudson River Boom Association was formed for common protection and cooperative action. The maximum of logs handled was reached in 1872 when, at the big boom of Glens Falls, almost 200,000,000 feet of logs were sorted. It was magnificent timber, too, for nothing less than twelve inches was cut.

The record of the Hudson River drives as preserved by the Hudson River Boom Association, Glens Falls, and as reported by E. D. Simmons, secretary, is as follows:

RECORD OF HUDSON RIVER LOG SORTING.

Statement of Sawlogs Put in the Hudson River and Its Tributaries—1850 to 1905.

Year.	19-inch standards	Year.	19-inch standards.
1851	132,553	1878	572,103
1852	345,412	1879	732,581
1853	303,084	1880	683,107
1854	299,281	1881	769,992
1855	302,670	1882	584,504
1856	292,539	1883	828,920
1857	298,194	1884	714,429
1858	331,885	1885	752,964
1859	400,210	1886	564,472
1860	353,322	1887	616,045
1861	526,809	1888	610,880
1862	243,912	1889	611,084
1863	309,600	1890	555,941
1864	278,618	1891	604,751
1865	292,526	1892	740,339
1866	507,550	1893	539,198
1867	832,126	1894	382,846
1868	599,816	1895	360,590
1869	543,175	1896	387,145
1870	687,206	1897	351,928
1871	551,626	1898	340,101
1872	1,069,572	1899	271,709
1873	824,084	1900	282,777
1874	446,808	1901	260,729
1875	562,904	1902	351,209
1876	572,347	1903	284,757
1877	674,527	1904	270,889
Total			26,606,396

The above table is a record of the number of standards scaled at the Glens Falls boom in the years named. A standard, on the Hudson River, is the equivalent of a log thirteen feet long and nineteen inches in diameter inside the bark at the small end. Logs longer or shorter, or of greater or less diameter, are reduced to this standard, so that the figures given do not represent the actual number of pieces of timber but the number of standards to which the actual timber has been reduced. Such a standard log, by the Scribner rule, contains 195 feet board measure; by the Doyle rule, 183 feet, but, according to the secretary of the association, the Hudson River Boom Association allows 186 feet for each standard. On this basis, a total of 26,606,396 nineteen-inch standards, accounted for during

fifty-four years of operation, would measure 4,948,789,656 feet board measure. This is an average, for the entire period, of 91,644,253 feet annually. As stated before, the highest record was in 1872 and was 189,940,392 feet. In 1904 the output was 50,385,354 feet. Formerly, the entire product of the Hudson River was of sawmill timber, but now much of the output is devoted to the pulp business.

REMINISCENCES OF EARLY DAYS.

Many reminiscences are available, some of them of historical value and some principally of sentimental interest, regarding the lumber industry in its development in northeastern New York. But space does not permit extended use of such material, and, therefore, only a few can be quoted.

Whitehall, New York, at the head of the Champlain Canal, connecting Lake Champlain with the Hudson River, is also at the head of Lake Champlain. Before the opening of the canal, in 1822, the timber of the Adirondack region, tributary by stream or sled haul to Lake Champlain, was largely sent down the Sorel River to Quebec and thence exported. Even before the opening of that canal, however, as has been elsewhere stated, there were a few mills located near the upper, or southern, end of Lake Champlain which transported their product by sleighs, during the winter season, to the Hudson River, by which it was forwarded to Albany, New York and other Hudson River points. In an article regarding Whitehall, published in 1875, in a predecessor of the *American Lumberman*[3], there are interesting reminiscences concerning the early part of the Nineteenth Century. The following is quoted from that article:

> Within the life of men now living, before the wilds of Upper Canada were penetrated by the white man or its inexhaustible timber wealth was discovered, the timber market of Quebec was supplied from the shore of Lake Champlain, Whitehall contributing in no small degree to the wants of her Canadian neighbor. In the spring of 1812 Kegs, Stafford & Hoyle got together a large raft of pine timber at Peru, New York, on the west side of the lake, and started on a voyage. When outside of Valcour Island the raft was broken up by a heavy north wind and the timber was scattered broadcast, but, as the wind continued in the same direction, the timber was driven on shore at Quaker Smith Bay, Shelburne, Vermont. Our informant states that he was employed in gathering this timber together, rerafting it, etc., and afterward he went with the raft to Quebec, arriving there at the time of the declaration of the War of 1812. The English government confiscated the timber, and the crew "skedaddled" back to the States as best they could.
>
> For a time the trade was interrupted by the war which followed. Subsequently it was resumed, but only for a season. Soon after that time the upper portion of Canada was undergoing settlement, and the supply which had been coming from the States was derived from its own resources. As early as 1818 Melancthon Wheeler, late of this place, was engaged in the lumber trade, and a few yet survive who speak of its magnitude of that day, and with animation recount the many incidents connected

[3]The *Lumberman's Gazette*, January 30, 1875, page 7.

therewith. In succeeding years he secured from the shores east of Whitehall and from the banks of South Bay large quantities of pine and oak timber, which were rafted together and floated through the lake, the only motive power being small square sails hoisted on poles. Weeks were consumed in the voyage through the lake to St. Johns,[4] Lower Canada, where the raft was divided into sections and run down the river and over the Chambly rapids, thence to Sorel, where the whole would be fastened together and proceed down the St. Lawrence to Quebec. A voyage full of incidents and hair-breadth escapes was certain to be encountered by the crew.

William B. Millard, of Rouse Point, New York, who has been in the lumber business on the Hudson River and on Lake Champlain for fifty-three years, from his own recollections and from records and traditions of his family and company has given to the author an interesting summary of the development of the lumber business on Lake Champlain. He states that he cannot go back farther than 1822, the year that the Champlain Canal was opened. This canal cost $4,044,000, is eighty-one miles long, extending from Whitehall, on the north, to West Troy, on the south, and has thirty-two locks. Prior to 1822 all communications were by stage from Troy to Whitehall. At the latter point, passengers boarded steamboats running on Lake Champlain for northern points. After the canal was opened, passenger packets were put on the canal, transit lines were established by different companies, and warm competition was maintained for years. At that time the canal boats were small, carrying only from forty to fifty tons, but the canal was enlarged from time to time so that boats carrying 150 tons can pass through at this time (1906).

Prior to 1822 there were many small sawmills along the upper Hudson as far north as Glens Falls. The lumber they sawed was rafted and floated all the way down the Hudson as far as New York City, small yards at other points on the Hudson also buying the rafts. Shingles, which in those days were usually rived rather than sawed, were shipped on top of these rafts. Much trouble was had in floating these rafts over the rapids. At this same time there were a good many small mills along the lower Hudson, from Albany down, that secured their supply of logs from the upper river.

After the canal was opened many sawmills were put up on both sides of Lake Champlain. One of the greatest contributors to the log supply was the Chazy River, which was navigable as far as the village of Champlain. There a number of sawmills were established which secured their logs from that vicinity and from Canada, which was close by. Hundreds of teams drew in the logs daily out of the Provinces. At Champlain canal boats were loaded with lumber for points on the Champlain Canal and on the Hudson River. There were no tow boats then. The canal boats had masts and sails, which were used as far south as Whitehall. Reaching

[4]This is the St. Johns on the Sorel, or Richelieu River, now in the Province of Quebec.

that point, their masts were unstepped and the boats were towed through the canal to Waterford and West Troy, where their masts were restepped, and so they sailed on down the Hudson.

The following is directly quoted from Mr. Millard's[5] narrative:

In 1823 was the first time my grandfather [Charles Millard], at New Hamburg, received a canal boat load of lumber from Lake Champlain. Captain Barnes, of Whitehall, was the captain of the boat. My grandfather gave a turkey dinner in celebration of the event, to which Captain Barnes went in his flannel shirt sleeves, though apologizing for his appearance. In telling the story of his trip he said that on the way down the Hudson his boat got grounded on the middle ground opposite Hudson village. He had commenced to unload his lumber into the water, so as to lighten the boat, when a man came out from shore in a row boat and told him that if he would wait a few hours the tide would lift him off without any exertion on his part. As on Lake Champlain there is no tide, he did not appreciate the different conditions on a tidal river.

In 1823 my father [Walter Millard] rode on horseback from Poughkeepsie to Whitehall, more than 160 miles. There he left his horse and proceeded on foot along the eastern shore of Lake Champlain, looking for timber and logs and stopping at Vergennes and other points. Crossing the lake from Burlington to Plattsburg, he stopped at the latter point with a small farmer on the Ausable River, at the point where, in the War of 1812, the battle took place between the English and Americans. The farmer showed him some fruit trees that had been barked by the bullets. The village of Plattsburg was founded by five or six families from Poughkeepsie, Dutchess County, by the name of Platt. The editor of the *Poughkeepsie Eagle*, now living at Poughkeepsie, is a descendant of one of those families.

On his way south along the west shore of Lake Champlain, to escape a severe rain storm, my father asked to stay over night with a family which had only one room for a large number of children. As he entered the door he found the family surrounding the table in the center of the room, each with a wooden spoon dipping into an earthen bowl, eating what is known as corn-meal stir-about. In those primitive days in that primitive country they had no plates or individual bowls. Here he secured the privilege of lying on the floor during the night.

From there he walked to Chubbs Dock, not far from the mouth of the Ticonderoga River. Mr. Chubb was engaged to act as my grandfather's agent, purchasing hewn timber through the winter so that it could be rafted down through the canal on the opening of navigation in the spring. Mr. Chubb thus acted for my grandfather for

[5]William B. Millard is president of the Millard Lumber Company, of Rouse] Point, New Hamburg and Wappingers Falls, New York. Howard C. Millard is vice president, and Charles Millard is secretary and treasurer. Their great grandfather was John Millard, a Huguenot, who was born in 1736 and died in 1813. He had a sawmill at Cornwall, Connecticut. His son, Charles Millard, born in 1763, joined Washington's army in 1780. After leaving the army, he was with his father in the lumber business at Cornwall, Connecticut, but moved some time before 1800 to Marlboro Ulster County, New York, on the west side of the Hudson River. There he operated two sawmills until 1824, getting his logs from the headwaters of the Hudson River at Fort Edward and vicinity. His son, Walter Millard, the father of the present representatives of the family, when only twenty-one years of age made the log buying trip to Lake Champlain recounted in the narrative. In 1824 the business was removed to New Hamburg, Dutchess County, on the east side of the Hudson River, opposite Marlboro, where a retail yard was established, most of the lumber coming from Lake Champlain in canal boats. Charles Millard died in 1829, Walter Millard, his son, continuing the business. William B. Millard, oldest son of Walter Millard, became a partner in 1863, the firm being W. Millard & Son. In 1880 Walter Millard died and the business was then managed by W. B. Millard until 1884, when the firm of W. Millard's Sons, consisting of William B. Millard, Charles Millard and Howard C. Millard, was formed. This was succeeded in 1892 by a stock company, formed by the same people, called the Millard Lumber Company, as at present. William B. Millard, the president, lives at Rouse Point, where is situated the company's principal sawmill, planing mill and box factory. Howard C. and Charles Millard live at New Hamburg, where the company has wholesale and retail yards and general offices. Another mill of the company is located in the Adirondacks, near Mineville, Essex County.

several years. The logs thus secured were taken to Marlboro, Ulster County, at the mouth of Jew's Creek, and there sawed into such lumber as is used for doors, sash, blinds and inside trim of dwellings. The lumber yards situated on the Hudson River depended entirely upon this source for their supplies. It was but a short time after the canal was opened before the small mills on the lower Hudson found it unprofitable to bring the logs so far for sawing, and then an enlarged trade grew up between the mills on Lake Champlain and the lumber yards on the lower Hudson.

I am not able to give the statistics concerning the quantity of lumber that was shipped out at that time, but the trade continually increased, until the canal was built at St. Johns, Canada, so as to get around the rapids in the Richelieu and from there into the River St. Lawrence, which made a direct water communication between the St. Lawrence River, the Ottawa River and the Hudson River.

At the present time there are comparatively few sawmills on the shores of Lake Champlain, though on either shore there are a few on the lines of the different railroads, but their supply of logs is very limited. There is, however, a large trade in lumber and pulp, both by canal and by rail, through the lake from Canada. As far as lumber is concerned, Rouse Point is one of the most important ports of entry in the United States, only five or six ports doing a larger business. It is an important railroad center, and being at the foot of the lake and at the head of the Richelieu River, it is on what was the great thoroughfare between Canada and the States for two hundred years.

In 1905 the importations via Rouse Point were 102,336,871 feet of lumber; 49,347,250 pieces of lath and 18,161,059 shingles. Of the above quantity of lumber, 66,497,677 feet were brought in by water. During the same year the importations of lumber via adjacent points were as follows: Via Malone, New York, 24,218,301 feet; via Swanton, Vermont, 20,708,533 feet; via Alburg, Vermont, 27,087,942 feet. In addition to the above there was about 8,000,000 feet imported into Burlington, Vermont, by water.

STREAMS AS PUBLIC HIGHWAYS.

The use of the rivers by loggers and lumbermen called for legislation from time to time. The first stream declared a public highway was the Salmon River in Franklin County. An act passed in 1806 provided it could be used for rafts and boats below Malone. The lumbermen were prohibited, however, from obstructing the river. It was not until 1854 that the legislature put its official sanction on the extensive use of the river for the floating of logs. The Raquette River was declared a public highway in 1810 and some restrictions were placed on the lumbermen. The Black River was declared a highway in 1821 and the Grasse in 1824. In later years the legislature more fully recognized the importance of the lumber industry and finally made appropriations to clear and improve these channels. In the Adirondacks the river drivers had the additional difficulty of moving logs through lakes, where, instead of a helpful current, often a contrary wind was encountered. Here the logs had to be enclosed in booms and then moved with an anchor and windlass. The logging railroad is a later development and has done much to do away with the old river driving.

There are two sentimental incidents connected with the forest history of New York. The first was the composition in 1830 by George P. Morris,

then a resident of the upper part of Manhattan Island, of the celebrated lines, "Woodman, spare that tree!" The other resulted in the circulation of a stanza of less poetic merit but of even greater local celebrity, which runs as follows:

Hemlock and spruce
Up hill and down;
Hell and damnation;
Old John Brown.

This poetic effort was the result of the occupation of a tract of land in Essex County by John Brown, later of Harper's Ferry fame. Some years previous to the events which had such a tragic termination in Virginia Brown had bought a farm among the Gerrit Smith negro settlers in this county; but two years sufficed to exhaust his enthusiasm and he returned to his business as a wool buyer in Ohio.

CHAPTER XXI.

NEW YORK CITY.

The broad proposition that "the first settler was the first lumberman" is applicable to a great lumber consuming market like the Metropolitan District no less rightly than it is to the pioneer who opened up to the advance of civilization the great inland territory, although this saying has been associated more with the "pathfinder" than with the settler himself.

It has been officially recorded that the first traffic in lumber in New York (then New Amsterdam) was conducted by the Dutch West India Company in 1633, in which year that company installed the first sawmill in what is now the city of New York. Sawmills were erected within what is now included in the limits of the Metropolitan District by John Palmer, of Castleton, Staten Island, in 1669, and by Joseph Carpenter at Jamaica, on Long Island, in 1675. Carpenter had an agreement with the town of Jamaica whereby he was permitted to use timber from the common lands, "except clapboard and rayle trees under eighteen inches," and was to saw for the town "twelve pense in the hundred cheaper than any other persons of any other town," and for the citizens of the town "that bringeth the timber one halfe of the sawn stuff for their labours—provided it is only for their own use."

Several other interesting records of the Seventeenth Century are available, which are amusing when viewed from present conditions of supply. For instance: Henry Townsend, who erected a sawmill at Oyster Bay, Long Island, in 1683, was rewarded by the town as follows: "For building this mill the town grants to Townsend and his heirs forever the right to cut and use timber from any part of the town he shall choose and the right to sell such timber either in town or out of it." This was rather a broad endowment; but it is presumed that he and his heirs have long since exhausted the privilege of conducting lumbering operations in that now thriving town of Oyster Bay, the home of President Roosevelt.

During the first one hundred years of the existence of settlement on Manhattan Island, and with some variations up to the American Revolution, the lumber market of New York presented two interesting and important phases. These were local consumption and export demand. There are certain things to be borne in mind: New York at the time of settlement was covered with magnificent pine forests; the quantity far exceeded local needs; the settlers were the Dutch; the Dutch had far

eclipsed the English as sawmillers; at the time of the settlement of New Amsterdam there was not a sawmill in England, while there were numerous mills in Holland; England's lumber supply was hand-hewn at home or mill-sawn in Holland. It was most natural, then, that the early Dutch settlers of New Amsterdam should ascend the Hudson and engage in lumber manufacture as a source of livelihood and profit. It was also natural, when the manufacture exceeded the demand at home, that they should ship to England, their old customer. Thus it came naturally about that Manhattan became the first American export lumber market.

The first shipment of lumber from New Amsterdam to Europe was made in 1626 to Holland by settlers of New Amsterdam, three years after the first shipload of immigrants had landed. While there had been earlier shipments of wood from New England, this is believed to have been the first export of American sawed lumber. That the business soon was established on a substantial basis is shown by the fact that Governor Dongan, in a report to his home Government in 1686, offered to "send over boards of what dimension you please," closing his letter with the interesting information that "three-inch oak plank for batteries cost me fifteen shilling the hundred feet"—a comparison with present day values of much interest.

At the time of its settlement New York State as a unit was not only an almost unbroken forest but a distinctive white pine state as well, and this species of timber was for years, after the lumber industry had fairly started, its principal production; while for quality and size the New York State white pine compared favorably with any of the later day famous sources of that wood in the West. Some of the veterans of the trade yet recall the mammoth growth of the good old "Chemung County cork pine," as it was familiarly known in its palmy days, running as it did, according to Government statistics, from 130 to 200 feet tall, with a diameter of two to six feet, the latter being exceptional, however. Allegany and other contiguous counties were also important sources for white pine, and it is the claim of many of the veterans in the trade that the best Michigan white pine never equaled the New York product. It is also a matter of history that the busy thoroughfare, Pine Street, New York, was named after the beautiful and gigantic white pines which adorned the nearby farm of Jan Jansen Damen. Another interesting fact in connection with the State pine was that it grew among the hardwoods and not in compact bodies as in the West.

As though its superlative importance as a receiving lumber market rather than as a point of manufacture were predestined, the lumber industry of New Amsterdam, and its nomenclatural successor, New York, grew very slowly. There were reasons, however, more substantial than

the mere theory of predestination. There was no means of transportation but the rivers; and, as far as New York was concerned, this meant the Hudson. But, with the settlement of the colony, Albany soon outranked New York as a lumber loading point. The rafting of logs to New York for manufacture was out of the question for one, if for no other reason—the wind and tide were both against such a project. In consequence, lumber manufacture was conducted on the upper Hudson with greater facility than at New York, once the timber in the immediate vicinity of Manhattan had been utilized. The Hudson below Albany was seldom used by raftsmen. The lumber was loaded into vessels at Albany for shipment to New York or England.

The development of the lumber market of New York was very slow in the colonial period. Before the Revolution its importance as a point of manufacture had declined. Indeed, the diminution of the forests in the vicinity was indicated as early as 1700 in a letter by Lord Bellomont, Governor of New York, in which he recommended that each person who removed a tree should pay for planting "four or five young trees."

It was only with the growth of the metropolis itself that its importance as a lumber market increased, after its early prominence as a point of manufacture had declined. That development, it must be remembered, has been comparatively recent, but it has been rapid, and the lumber market of the City of New York has kept step with it. The following table shows, by census reports, the increase in the population in New York from 1790 to 1905. In 1898 New York proper and the other boroughs were united into what is known as Greater New York; so to make the comparison exact, the figures for the years previous to 1900 include the population of the whole present Metropolitan District:

1790	49,401	1860	1,174,779
1800	79,216	1870	1,478,103
1810	119,734	1880	1,911,698
1820	152,056	1890	2,507,414
1830	242,278	1900	3,437,202
1840	391,114	1905 (Est.)	4,014,304
1850	696,115		

The years have witnessed an evolution in the customs of both the wholesale and retail trade which, from the standpoint of present day methods and sources of supply, makes old methods almost ludicrous. They, nevertheless, contributed bit by bit to the development of the Metropolitan District—now possibly the greatest lumber consuming center in the world, with 1,696,014,604 feet to its credit in 1900, the latest year for which official compilation has been made.

Situated as the district is on the shores of one of the finest harbors in the world and, in fact, completely surrounding it, with unequaled natural facilities for railroad and steamship terminals and with the great Hudson River, with all its natural and artificial tributaries, bringing it into touch

with the great supply markets of the North and West, particularly within recent years since methods of transportation have been practically perfected, the Metropolitan District has been particularly favored in its development as the great lumber consuming market and city that it is. There are other wholesale markets in the country which have handled greater volumes of lumber within a twelvemonth, but in consumption the Metropolitan District leads the world. It has often been said that not all of the lumber entering the Metropolitan District is consumed there, much being reshipped to other points; but the facts are that the percentage so handled is insignificant in comparison with the amount consumed, as New York is not now what might be termed an export port or wholesale market in any true sense.

During the period between 1830 and 1840 New York State as a lumber producing territory was at the zenith of its career, with West Troy and, a little later, Albany as the great wholesale centers, the State itself providing practically all the lumber used in the Metropolitan District. West Troy was the great wholesale market in those days, Albany not gaining much prestige until the early '50's, although in the later '40's Whitehall as a Canadian outlet was quite a lumber center; but, in general, Canada and western sources at that time were a matter of the future. Buffalo and Tonawanda were not, as lumber markets, unknown, while the now enormous traffic in southern lumber did not begin in noticeable volume until after the Rebellion. Such being the case, it is not surprising to find that many of the veterans of the trade learned the business in the Troy and Albany markets or were associated in some way with the trade in those centers.

During the early '30's the wholesale lumber trade consisted primarily of shipping by schooner from West Troy to New York, schooners being in those days as much of a feature in trade as cars are now. What railroads existed cut no figure in the trade then, while Michigan had not been thought of as far as supplies of lumber for this eastern district were concerned. Lumber so shipped to the district in those days which was not on special order was peddled out from the dock to buyers. The schooners, too, were small in those days as compared with modern vessels. The canals and the great Hudson River and its tributaries were the channels of lumber transportation. For years white pine, spruce and hemlock, particularly the first named, were the great leaders in the local market. But in later years white pine has not led the other lumbers which have come into use to the extent it once did, and today it is but one of the numerous woods in the lumber trade. One of the reasons for this is that in the earliest days of the yard trade the dealers used to sell large blocks of pine to the carpenters, builders and the manufacturing trade as it stood in the yard, which lumber

so bought was manufactured into sash, doors, blinds, trim and various other commodities for use in the district; and, while there is quite a number of firms still engaged in that line, this business in later years has largely been transferred to the West, where the present manufacturers and dealers in manufactured lumber goods now buy the material already manufactured in whole or in part, and the large blocks of lumber for such purposes are no longer brought here by the dealers, but find their market in western and northern manufacturing points. In the heyday of white pine it was a common thing to sell 100,000 to 200,000 feet of white pine flooring, but time has brought the introduction of yellow pine, North Carolina pine, cypress and the hardwoods.

In the early days of the distinctive yard business which sprang up after the war, although there were several yards doing business in the district in the middle '50's, with the decadence of the primitive methods of handling lumber direct from the vessels on the water front, the retail business was a simple and direct transaction between the buyer and seller, with none of the intricacies of the present complicated system. The buyer would go into a yard in those days and buy a thousand feet of this, that or the other kind of lumber, cart it away to his shop and work it up into a variety of things, returning for another supply in due time. There were none of those exacting orders of schedules as nowadays, necessitating a preponderance of figuring and the employment of a large force of clerks, inspectors, yardmen, etc., nor was there such close attention paid to the filling of orders to the exact letter as obtains today. The partners in a business then did what it now takes a corps of employees to handle. The natural result has been an enormous increase in the cost of doing business. Forty or fifty years ago no building was done except by thorough mechanics; but now the real estate men have largely occupied the field and, while they are, perhaps, as a class financially as good, they are not always mechanics, which burdens the yard dealer with added responsibility.

Another feature of those early days, now obsolete, was that of charging cartage on all deliveries. Now the delivery part of the business is a fixed charge with nothing but its share of the general profits as an offset. In the early days forty plank and fifty boards, or forty joists and fifty wall strips, or 500 feet of spruce constituted a load; and, if an order called for 100 strips, or 80 joists, or 1,000 feet of lumber, it was counted as two loads just the same; and, though carted on one trip, the charges were doubled, the drayage price being 37½ cents a load.

In the selling end of the retail business the change has been no less complete. Nowadays in some sections of the district, notably Brooklyn, lump sum bidding (that is, a request by a builder for a bulk price on a schedule of material which has, perhaps, twenty-five to 100 items of different sizes

of various kinds of lumber) has largely displaced the old system of buying, particularly in the building trades. In the early days the dealer had as his customers practically all buyers, including carpenters, builders, the sash, door, trim and box trade, ship joiners and furniture and piano manufacturers, as these trades and manufacturing interests developed; but the keen competition in these various branches, coupled with the ever increasing supply of lumber and the evolution of business methods generally, has brought about an almost entire revolution in buying. Slowly but surely, one by one, the various component parts of the great consuming trade have sought as their source of supply the same wholesale markets from which the dealer originally made his purchases, with the exception of the carpenter and builder and such of them as manufacture for their own use, which are practically all that is left to the retail dealer. It was to this evolution in buying that the association idea and its general adoption is indirectly traceable, the idea which is now so important a factor in the lumber trade of the country, seeking as it does to guide the trade in channels which conserve the interests of both wholesaler and retailer.

FIRST RETAIL LUMBERMEN'S ASSOCIATION.

The New York Lumber Trade Association, organized at the Gilsey House, New York, Wednesday, October 27, 1886, was practically the first distinctive retail lumber association in the East. Other organizations of similar character had been formed prior to 1886, but as a live and important factor in trade affairs and as a nucleus to the great association movement in the retail trade throughout the eastern states which followed its formation, the New York Lumber Trade Association has been sponsor to much of the good that has resulted to the eastern retail trade generally.

The association grew out of an awakening to the evils obtaining in the Metropolitan market at that time, which arose out of the absolute lack of organization within the lumber trade. Competition was not only unrestricted, but bitter and, in many cases, illegitimate. Fraudulent contractors made lumbermen their victims almost without check and were encouraged by the lack not only of organization but even of social acquaintance within the trade. It was decided that an incorporated body was the proper form of organization; therefore, fifteen incorporators were selected, who met on October 27, 1886, at the Gilsey House and decided that an organization should be perfected to be called the New York Lumber Trade Association. The permanent officers selected at this meeting were president, Ichabod T. Williams; first vice president, Charles A. Meigs; second vice president, A. W. Budlong; secretary, J. D. Crary. The fifteen original trustees were Abraham T. Buckhout, William W. Budlong, Jesse D. Crary, Tucker David, Olney B. Dowd, William Gibson, George Hagemeyer, John S. Mason, Charles A. Meigs, Elias H. Ogden,

Charles E. Pell, Chauncey Stevens, Leander Stone, Edward P. Walling, Ichabod T. Williams.

A meeting for the perfection of the association occurred on November 8, 1886. Four standing committees were given charge of various branches of the proposed work of the organization. They were as follows:

Committee on admissions—Leander Stone, John S. Mason, Charles E. Pell and E. H. Ogden.

Committee on arbitration—Charles A. Meigs, E. P. Walling, Olney B. Dowd, Tucker David, Chauncey Stevens.

Committee on appeals—Charles E. Pell, A. W. Budlong, George Hagemeyer, A. T. Buckhout.

Committee on inspection—George Hagemeyer, Charles A. Meigs, Leander Stone, John S. Mason, Elias H. Ogden.

The association adopted the plan of monthly meetings, usually accompanied by a dinner, which served to make and cement acquaintance among the members. As the affairs of the association grew in magnitude, more and more of the work was left to committees, with less frequent meetings, the regular gatherings of the association being three yearly—in October, when the annual meeting is held, in January and in April, on the second Wednesdays of the respective months. The first quarters of the association were at Broadway and Thirtieth Street; in 1887 and 1888, at 66 West Twenty-third Street, and since that time at 18 Broadway.

The successive presidents of the association, with the years in which they were elected to that capacity, were the following: Ichabod T. Williams, 1886; Charles A. Meigs, 1887 and 1888; Abraham Steers, 1889 and 1890; Charles H. Willson, 1891; James H. Pittinger, 1892 and 1893; W. H. Simonson, 1894 and 1895; John F. Steeves, 1896 and 1897; Charles L. Adams, 1898 and 1899; Richard S. White, 1900, 1901, 1902 and 1903; James Sherlock Davis, 1904, 1905 and 1906.

The first secretary of the association was Jesse D. Crary, who served until October, 1889. He was succeeded by E. Hudson Ogden, who served until 1894. On his death, in that year, W. R. Bell, Junior, was elected secretary, which office he held until April 26, 1900, since which time until the publication of this work, in 1906, Jesse D. Crary has been secretary.

The first treasurer of the association was Charles E. Pell, and the second, Charles F. Fischer, who was still in office in 1906.

The officers serving in 1906 were as follows:

President, James Sherlock Davis; first vice president, A. P. Bigelow; second vice president, Guy Loomis; secretary, Jesse D. Crary; treasurer, Charles F. Fischer; trustees, James H. Pittinger, William H. Simonson, John F. Steeves, D. M. Resseguie, J. T. E. Litchfield, Hammond Talbot, Louis Bossert, J. L. Cutler, A. P. Bigelow, I. P. Vanderbeek, C. W. Wilson, Charles L. Adams, William R. Bell, Junior, Gulian Ross, Frederick W. Starr, Albro J. Newton, William P. Youngs, Richard S. White, James Sherlock Davis, Williams S. Wandel, Guy Loomis, E. M. Wiley, Peter A. Smith, John

Egan, Charles F. Fischer, T. D. Carpenter, E. D. MacMurray, John J. Cooney, George C. Lavery, Waldron Williams, J. C. Creveling, Rowland McClave, William F. Clarke, Russell Perrine, Homer A. Millard.

The primary object of the association was to confine trade within its legitimate channels, and to that end it recognized the wholesaler, the retailer and the consumer. One of the first committees appointed by the association after its organization was on trade relations. The history of the association has been largely made up of attempts, in the main successful, to accomplish this primary purpose. On November 21, 1893, the association took part in a joint convention of wholesalers and retailers, at which five retail associations were represented, with the purpose of defining, if possible, to what trade the wholesaler should confine himself and to whom he could sell without conflicting with the legitimate trade of the retailer. This meeting was attended by representatives of the New Jersey, Connecticut, Pennsylvania, Massachusetts and New York retail associations, of the National Wholesale Lumber Dealers' Association and of the wholesale markets of Albany, Oswego, Buffalo, Tonawanda, Toledo, Saginaw, Boston, Philadelphia, Baltimore and Norfolk. To this convention were presented the following definitive resolutions:

We recognize as wholesale dealers, and as such entitled to the exclusive patronage of the retail trade, those persons who sell within these States to other wholesale or retail lumber dealers only.

We recognize as retail lumber dealers those persons within those States who purchase lumber from manufacturers and recognized wholesale dealers, who own or operate a lumber yard where a stock of lumber is at all times kept for sale to the public, and who are not themselves engaged in building or otherwise consuming lumber in competition with the usual customers of a retail lumber yard.

We recognize the necessity of wholesale consumers in other lines buying lumber in large quantities, at wholesale prices, but no wholesale lumber dealer shall solicit or sell to such trade until the character of the business has first been determined and officially declared by local registration to the whole trade by the Board of Managers of the Retail Dealers' Association in accordance with the By-Laws of the State (or, in New York, of the Metropolitan District) in which such establishment is located, and such record shall be open to known members of wholesale associations only.

We believe that the interests of the wholesaler, retailer and consumer will all be conserved and protected by an acknowledgment of the rights of each, and a united purpose to maintain them all, and to that end we recommend the favorable action of the associations which we represent.

These resolutions failed of universal adoption and the next important movement toward establishing reciprocal relations between wholesalers and retailers was in 1898 at the annual meeting of the National Wholesale Lumber Dealers' Association, held at Cleveland, Ohio, on March 2, in that year. The outcome of that consultation was the appointment of a committee on trade relations by the national association, which met a corresponding committee of the New York Lumber Trade Association on

October 11, 1898. At this conference the equity of limiting the solicitation and transaction of business within defined lines was acknowledged, and, in order to provide for means of determining these lines, a resolution was adopted for the settlement of any dispute as to the classification of consumers by joint arbitration between committees of the New York Lumber Trade Association and the National Wholesale Lumber Dealers' Association. This action led to a joint meeting between the National Wholesale Lumber Dealers' Association and representatives of ten retailers' associations at Boston, March 1 and 2, 1899. The outcome of this conference was the adoption of the "Boston Agreement" referred to elsewhere. Various amendments to this agreement are recounted in connection with the history of the National Wholesale Lumber Dealers' Association.

An outgrowth of the New York association was the Eastern States Retail Lumber Dealers' Association, which was organized October 1, 1902, by the New York, New Jersey, Pennsylvania, Connecticut, Philadelphia and Boston retail lumber dealers' associations, as an outcome of sundry delegate meetings that had been held at intervals, beginning with 1895.

Aside from the work of the New York Lumber Trade Association in bringing about proper trade relations among the various members of the lumber business, it has found one of its most important fields in representing the lumber trade during times of labor disturbance. In May, 1891, lumber handlers and teamsters in New York went on a strike for shorter hours and higher wages. Under the guidance of the association a successful fight was made which resulted in breaking up the Lumber Handlers' and Truck Drivers' Union. It is estimated that the workingmen of New York City lost during that strike more than $1,500,000 in wages, while, through boycotts and through loss of business otherwise, the lumbermen of New York City and others interested in the building trades lost heavily.

Following this experience were twelve years of labor peace, and then, in 1903, came the great strike of that year. At the beginning of the trouble, on May 4, 1903, a special meeting of the New York Lumber Trade Association was called, at which a labor committee was appointed. The labor union, called the United Building Material Drivers' Association, demanded of employers that they should hire no person as driver who was not a member of the union and should pay certain wages and give employment upon certain conditions specified. This demand was indorsed by the United Board of Building Trades of New York and vicinity. To meet this condition and to preserve the trade of lumber dealers who refused to sign this agreement, the labor committee of the association referred to above recommended as follows:

That we close yards in the boroughs of Manhattan and Bronx on Wednesday,

P. M., May 6, 1903, so far as delivery of lumber in those boroughs is concerned, and that the yards in Brooklyn, Queens County, Staten Island and that part of Hudson County, New Jersey, east of the Hackensack River, deliver no lumber in the boroughs of Manhattan and Bronx until such time as the committee shall decide the present labor troubles absolutely settled.

Also, that the yards in Brooklyn, Queens County, Staten Island and that part of Hudson County, New Jersey, east of the Hackensack River, close whenever this committee instructs them to do so.

Thus was a lockout opposed to a threatened, but not yet declared, boycott. The employees of the yards in which strikes had been declared had expressed to their employers no dissatisfaction and made no demands, but the labor union movement was designed to bring about a unionization of lumber yard employees. Some exceptions were made by the association to the close of business, as, for example, lumber needed in the export trade and in industries dealing with perishable goods, and municipal, state and national governments.

The strike of 1903 was one of the most bitterly fought in the history of New York labor disturbances, and for five or six weeks the entire building industry of New York and vicinity was practically suspended. There resulted a division in the labor ranks between the skilled labor employed in the building trades and the unskilled labor of lumber handlers and truck drivers, by which the support of the former was withdrawn from the latter with the result that, on May 10, the yards of the Metropolitan District resumed business. The lumbermen, under the guidance of the New York Lumber Trade Association, not only won a complete victory, but accomplished much for the establishment and maintenance of peace between employers and employees in the building trades of the entire East.

The New York Lumber Trade Association has had much to do with the development of lumber inspection and the regulation of prices on various woods. Until 1890 spruce in the New York market was simply an item used to influence trade, without much, if any, regard to the profit which dealers might make in handling it. In that year, however, a spruce agreement was put into effect by which prices were adopted as follows: "All timber nine inches and under wide, twenty-three feet and under long, not less than $18 a thousand. All timber nine inches and under wide, twenty-four feet and over long, not less than $20 a thousand. All timber ten inches and up, all lengths, and all square timber, $20 a thousand. No discount other than the usual discount for cash." These prices were subject to change and, later, were extended to cover West Virginia spruce. Other agreements have been made tending to regulate prices of yellow pine, North Carolina pine, maple flooring and various other items in the lumber market.

Soon after the association was organized a credit system was given serious consideration and a system of reports was put into effect early in 1892. By the use of this system losses have been greatly limited and irresponsible and fraudulent contractors and consumers largely have been denied credit.

Inspection rules were adopted almost immediately after the association was organized, inspectors were licensed and an inspection system built up. The system was designed to provide competent inspectors under supervision and thus insure the equity and efficiency of their work. The first inspection rules adopted covered hardwood lumber and logs. In December, 1897, the inspection committee recommended rules for the inspection of yellow pine and cypress, the rules for the former being those adopted by the Southern Lumber & Timber Association and known as the "Savannah Inspection of 1883," and the latter being those adopted by the Southern Cypress Lumber & Shingle Association. In 1906 the inspection committee adopted rules for the inspection of mahogany and revised the rules for the inspection of cypress.

Under the auspices of the association the question of mutual lumber insurance was the occasion for a joint meeting of eastern lumber associations in 1894, the outcome of which was the organization of several mutual lumber insurance companies or associations.

The New York Lumber Trade Association has been prominent in many other directions. It has been active in advocating desirable legislation at Albany; it has given much assistance toward improving the terminal facilities of New York, whether by rail or water, and in public affairs generally has been conspicuous and active. Its membership in 1906 consisted of 117 retailers and eighty-two wholesalers, with fourteen nonresident members.

NATIONAL WHOLESALE LUMBER DEALERS' ASSOCIATION.

Following the general organization of the retail lumbermen came the wholesalers' association. The National Wholesale Lumber Dealers' Association was initiated at a preliminary meeting held April 5, 1893, at 45 Broadway, New York City, after very careful investigation by wholesale lumbermen of the possibility and need of a wholesale lumber dealers' association. Many retail associations had been organized for self-protection and had, in a moderate way at least, encouraged wholesale dealers to associate with them by offering them association membership privileges and, in a few cases, full membership. These wholesalers attended the annual meetings of these organizations infrequently, as they had no place on the committees or in the directorate, and were not fully conversant with the matters of business usually presented. They soon learned that they were neither directly nor indirectly benefited by the affiliation; and the

few who did avail themselves of the opportunity to associate with the retailers learned that they had troubles similar to those presented by the retailers at their meetings. The wholesalers very early discovered that the remedy for many of the evils and abuses that existed in the trade, through the operations of so-called wholesalers and illigitimate commission men, must come largely from the wholesalers who desired only honest and fair business methods. There was also another evil which the wholesalers felt should be eliminated—the unfair retailer who attempts to profit by unbusinesslike methods, not only to the detriment of the wholesalers but also to the detriment of the honest, straightforward retail dealer. The wholesalers believed that the trade in general would be benefited by an organization which would work to improve the common interests of the trade and stand for the protection of those interested.

The call for organization well covered the general subject when it included, among the other sentiments:

"The objects of this association shall be:

"To act in accordance with the different retail dealers' associations, and to try to keep the wholesale trade in its legitimate channels.

"To keep lists of those who, in the association's opinion, are not entitled to credit.

"To maintain the best and fairest rules of inspection.

"In case of labor troubles to act in accordance with other legitimate wholesale and retail associations.

"The desire is to take in all wholesalers, but not in any way to interfere with local associations, and to be fair to wholesaler and retailer, and to encourage and promote good business methods.

"To have a committee on arbitration to act in all cases of disagreement laid before the association."

Among the firms who signed the call for the first meeting were: Dodge, Meigs & Co., the Shepard & Morse Lumber Company, J. S. H. Clark & Co., Graves & Steers, the Brunswick Lumber Company, Price & Hart, Wiley, Harker & Co., Dunbar & Cape, the Skillings, Whitneys & Barnes Lumber Company, W. B. Mershon & Co., W. Millard's Sons, R. R. Sizer & Co., White, Rider & Frost, W. E. Marsh & Co., W. H. Creed & Co., George Porter & Co. and C. F. Chellborg.

The call for the meeting was issued to 300 wholesalers, interested in the eastern markets, but only about twenty-five responded, viz.:

Shepard & Morse Lumber Company, Brunswick Lumber Company, Eppinger & Russell, Parmele-Eccleston Lumber Company, Richard Lamb, W. B. Mershon & Co., W. R. Creed & Co., White, Rider & Frost, W. Millard's Sons, Wiley, Harker & Co., R. G. Kay, Dodge, Meigs & Co., Guy E. Robinson, Baker Bros., D. L. White & Co., Badger & Winslow, Skillings,

Whitneys & Barnes Lumber Company, J. S. H. Clark & Co., Price & Hart, Rice-Blake Lumber Company, Seaboard Lumber Company, Hughson & Co., W. G. White & Co., E. W. Rathbun & Co.

These men are worthy of mention because they include those who were on the self-constituted committee which held preliminary meetings at various offices and which came to the meeting of April 18 well prepared to launch the association on its career. Many others sent reasons for not coming, and also wrote letters of indorsement.

Colonel J. S. H. Clark, a white pine wholesaler, was made chairman of the first meeting and E. M. Price, of the hardwood firm of Price & Hart, New York City, who had done faithful work in the preliminary formation, was made temporary secretary.

The meeting was an enthusiastic one, and it was easily seen that the formation of just such an organization as was desired was assured; but because of the many letters received from those in favor of the project who were not able to be present and because of many details necessary to effect organization, the meeting adjourned, to convene May 2, after the election of the following trustees:

H. M. Clarke, Richard Lamb, Robert G. Kay, Thomas F. Strong, Frederick W. Cole, W. B. Millard, E. C. Baker, J. W. Hussey, J. S. H. Clark, W. G. Frost and E. M. Price.

The meeting of May 2 was held at the Imperial Hotel, New York City, at which time the constitution and by-laws were presented and adopted and the following permanent officers were elected:

J. S. H. Clark, president; William B. Millard, treasurer, Henry Mandeville Clarke, secretary.

The association promptly started in on its mission. It immediately developed that there was work to be done on the question of trade relations, which soon presented itself in such a way as to establish its significance. The first meeting with a retail association for the consideration of this question was held at Asbury Park, July 12, 1893, with the New Jersey Lumbermen's Protective Association.

The next important meeting was held at Stanwix Hall, Albany, New York, when the foundation was laid for the organization of the Bureau of Information, or Credit Bureau, as it was then called.

The second annual meeting, May 2, 1894, was held at the Genesee Hotel, Buffalo, New York, at which time the following officers were elected:

John W. Robinson, president; Robert H. Jenks, first vice president; E. M. Price, second vice president; A. C. Tuxbury, treasurer; H. M. Clarke, secretary.

At that meeting it was voted to incorporate under the laws of the State of New York, and a committee was appointed to perfect the organization

and present to the board of trustees a set of by-laws and also to secure suitable offices in the City of New York. In the meantime the membership of the association had been materially increased, and considerable interest was manifested throughout the country in the desirability of such an organization. This encouraged the committee to hasten the incorporation and complete the organization.

June 12, 1894, the board of trustees met in the offices at 18 Broadway, New York City, and, in accordance with the provisions of the by-laws, filled the offices named in the incorporation articles, as follows:

John W. Robinson, president; Robert H. Jenks, first vice president; E. M. Price, second vice president; A. C. Tuxbury, treasurer; H. M. Clarke, secretary.

It was fully understood that the incorporated organization was a successor to the unincorporated, and was composed of the same membership, trustees and officers as its predecessor. The date of the annual meeting was also fixed at that time, as provided in the by-laws, for the first Wednesday in March of each year.

The officers had found that the requirements of the association made it desirable to have but fifteen trustees, divided into groups of five, serving one, two or three years each. At the meeting of June 12, H. M. Clarke was first employed by the association as its secretary and superintendent of the Bureau of Information.

The first board of managers of the Bureau of Information of the association consisted of John N. Scatcherd, chairman, Buffalo, New York; Charles M. Betts, Philadelphia, Pennsylvania; Robert C. James, Albany, New York; W. B. Mershon, Saginaw, Michigan, and H. E. Montgomery, Buffalo, New York.

The annual meeting of March 6, 1895, was held at the Continental Hotel in Philadelphia, Pennsylvania, the association being the guest of the Wholesale Lumber Dealers' Association of Philadelphia. At this meeting the following officers were elected:

John W. Robinson, president; C. M. Betts, first vice president; William Easton, second vice president; A. C. Tuxbury, treasurer; H. M. Clarke, secretary.

The annual meeting of March 5, 1896, was held at Saginaw, Michigan, the association being the guest of the Wholesale Lumber Dealers' Association of the Saginaw Club. The following officers were elected:

C. M. Betts, president; John N. Scatcherd, first vice president; John S. Estabrook, second vice president; A. C. Tuxbury, treasurer; H. M. Clarke, secretary.

The annual meeting of March 2, 1897, was held at the Imperial Hotel, New York City, at which time the following officers were elected:

C. M. Betts, president; John N. Scatcherd, first vice president; John S. Estabrook, second vice president; Frederick W. Cole, treasurer; H. M. Clarke, secretary.

The work of the association at that time was in very good condition and under the wise supervision of Mr. Clarke had been making rapid strides in efficiency and the confidence of the trade. Some work had been done with the various retail associations on the question of bringing about a better understanding of the relation of the wholesaler to the retailer.

The Bureau of Information had become a valuable adjunct of the association and consideration had been given to the publication of a rating book. However, in the meeting of 1897 the matter was voted down, because, as stated, it was a big undertaking and the time was not yet ripe for it. Further, Mr. Clarke's health was poor and a two months' vacation to help him to regain his health had been suggested as advisable.

December 5, 1897, the lumber trade was shocked by the announcement of the sudden death of Secretary H. M. Clarke at his home in New York City. At a meeting of the trustees, which was called for December 10, 1897, appropriate resolutions were passed by the board of trustees and published in the press of the country and sent to the members of the association and to his widow.

At this same meeting a committee was appointed to arrange for the employment of a new secretary, John J. McKelvey, counsel for the association, being employed by the board of trustees as temporary secretary. A number of applications were received by the committee and, at a meeting of the board of trustees February 16, 1898, at the office of the association, Frederick W. Cole, chairman of the special committee for the employment of a secretary, reported the following resolutions, which were adopted:

Resolved, that the board of trustees hereby adopt a report of the committee on applications for a new secretary and the recommendations therein contained, and authorize the employment of Eugene F. Perry, of New York City, as secretary of the association and superintendent of the Bureau of Information, under the terms and conditions and at the salary recommended in said report.

By unanimous vote of the trustees in person and by proxy it was carried, Mr. Cole voting personally and casting the votes of the other trustees, under the proxies given him.

The sixth annual meeting March 2, 1898, was held at the Hotel Hollenden in Cleveland, Ohio, and the association was the guest of the Wholesale Lumber Dealers' Association of Cleveland. The following officers were elected:

John N. Scatcherd, president; John S. Estabrook, first vice president; Robert C. Lippincott, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

This meeting was rendered conspicuous by the prominence given to the question of "trade relations." The paper which embodied it, presented by Pendennis White, of North Tonawanda, New York, was entitled "The Scalper and Illegitimate Trade." A resolution was presented for the appointment of a trade relations committee, with instructions to the committee to prosecute this work vigorously.

The seventh annual meeting March 1 and 2, 1899, was held at Young's Hotel in Boston, Massachusetts, and the association was the guest of the Lumber Trade Club of Boston. The following officers were elected:

John N. Scatcherd, president; Robert C. Lippincott, first vice president; C. H. Bond, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

An important feature of this meeting was the attendance of delegates from the various retail associations, as follows:

New York Lumber Trade Association—John F. Steeves, New York City; John H. Ireland, New York City; J. D. Crary, New York City.

New Jersey Lumbermen's Protective Association—William A. Jones, Newark; A. B. Ayers, Newark; James M. Reilly, Newark; N. E. Buchanan, Newark.

Connecticut Association—L. A. Mansfield, Bridgeport; F. G. Platt, New Britton; C. S. DeForest, New Haven; W. I. Todd, Wallingford.

New York State Association—S. H. Beach, Rome; S. T. Russell, Ilion; Spencer Kellogg, Utica.

Pennsylvania State Association—T. J. Snowden, Scranton; O. M. Brander, Wilkesbarre; B. S. Thompson, Luzerne.

Philadelphia Retail Dealers—Thomas Williams, Junior, Richard Torpin, H. Humphreys.

Missouri and Kansas—Harry A. Gorsuch, Kansas City, Missouri; Milo R. Harris.

Northwestern Lumbermen's Association—Maynard Crane, Cooperstown, North Dakota; J. H. O'Neal, Minneapolis, Minnesota; W. G. Hollis, Minneapolis, Minnesota.

Illinois Association of Lumber Dealers—E. F. Hunter, Chillicothe, Illinois.

These associations had been invited to have delegates present in joint conference for the purpose of establishing a working basis as to the classification of trade. After a very full discussion the following was adopted, known as the Boston Agreement:

THE BOSTON AGREEMENT.

At a meeting of delegates from the New York Lumber Association, New Jersey Lumbermen's Protective Association, Connecticut Retail Dealers, New York State Retail Dealers, Pennsylvania Retail Association, Philadelphia Retail Dealers, Missouri and Kansas Association, Northwestern Lumbermen's Association, and Illinois Association of Lumber Dealers, it was voted to recommend the adoption of the following suggestions for presentation to the National Wholesale Lumber Dealers' Association:

First: That they urge the National Wholesale Lumber Dealers' Association to take up and formulate rules to classify the trade into sections, as follows:

1. Manufacturers.
2. Wholesale dealers or agents.

3. Retail dealers and other legitimate customers of the wholesale trade;

The retail trade to be classified according to the rules governing such trade in the various states at the present time; provided that in case of any dispute, the matter shall be referred to a conference committee comprised of one member from the retail association and one from the national association; and, in case these two cannot agree, the two shall choose a third person, whose decision shall be final.

Second: That the National Wholesale Lumber Dealers' Association take up and consider the pronounced and recognized evils from which both branches are suffering, viz.:

1. Sales by manufacturers and wholesalers to consumers.
2. Sales by brokers, agents and commission men to consumers.
3. Sales and quotations by the so-called retail dealers to consumers, through agents, and by methods used by the wholesaler in soliciting trade from the retailers.
4. That the National Wholesale Lumber Dealers' Association consider and devise a plan which will enable it, with the coöperation of the retail trade, to control all such concerns.
5. That the National Wholesale Lumber Dealers' Association provide a plan whereby all wholesale dealers, manufacturers, commission men, agents and brokers reported by a state association for selling to the consumers shall be reported to the wholesale trade and manufacturers, and required to conform to legitimate rules of business.

JOHN H. STEEVES.

The following resolution was also adopted:

That it is the sense of this meeting that, in the event of the National Wholesale Lumber Dealers' Association complying with the requests adopted here today, the retail dealers shall pledge themselves so far as possible to buy only of members in regular standing of the National Wholesale Lumber Dealers' Association.

At its eighth annual meeting March 7 and 8, 1900, the association was the guest of the wholesale lumber dealers of Baltimore. The following officers were elected:

Robert C. Lippincott, president; Pendennis White, first vice president; Charles H. Bond, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

The association had been steadily gaining headway, the membership numbering 245, located in eighteen different states. The association had become very much interested in the question of fire insurance, and at the Baltimore meeting an effort was made to organize a reciprocal insurance agreement between members. However, it was found a difficult task and, while much work was done on it during the year, that particular agreement did not go into effect. There was, however, formed what was known as a protective trust fund, in which about fifty of the members participated. This was about the beginning of the insurance business, which afterward developed quite rapidly into other organizations for the handling of insurance for the general trade as a special business.

The Boston Agreement, which was made for the purpose of meeting the question of trade relations between retailers and wholesalers, was found to be inadequate and certain phases of the work had developed which made it necessary to augment the Boston Agreement with a further arrangement, which was afterward known as the Baltimore amendment.

THE BALTIMORE AMENDMENT OF THE BOSTON AGREEMENT.

WHEREAS, The agreement known as the Boston Agreement had been in effect for one year, and

WHEREAS, The above mentioned delegates from retail associations and the members of the committees on trade relations of the National Wholesale Lumber Dealers' Association appreciate the benefits to be derived from a continuance of the work specified in the Boston Agreement, and

WHEREAS, Certain hardships have been occasioned the members of said associations by delays in classifying the various branches of the trade, and as in order to obtain the best results under that agreement, it seems advisable more clearly to define and outline a plan for developing the work of classifying, now, therefore, be it

Resolved, That whenever a member of the National Wholesale Lumber Dealers' Association desires to sell to a trade [which] has not been classed as legitimate trade for the wholesaler, he shall notify the secretary of the National Wholesale Lumber Dealers' Association of the facts in the case, and request a joint classification; and it shall thereupon be the duty of the associations interested each immediately to appoint classification committees that will act with all possible promptness; and, in event of the classification committees disagreeing, a conference shall at once be appointed, as provided for in the Boston Agreement, and such conference committee shall report its determinations with as little delay as the facts will permit of; also be it

Resolved, That whenever the secretary of the National Wholesale Lumber Dealers' Association is asked by a member of said association if it is legitimate to sell a trade upon which no classification has been jointly established, the secretary of the National Wholesale Lumber Dealers' Association shall immediately request of the retail association interested a joint classification and the work of determining such classification shall proceed in accordance with the provision contained in the foregoing resolution, and be it also

Resolved, That, pending a report of the classification or conference committees the members of the National Wholesale Lumber Dealers' Association shall not sell to the trade being classified, and be it further

Resolved, That the retail associations, parties to the Boston Agreement, will not report to their members any members of the National Wholesale Lumber Dealers' Association who abide by the rules of said association and the Boston Agreement, and in no event will they report to their members any members of the National Wholesale Lumber Dealers' Association until they shall have been given an opportunity to be heard, and either to justify their action or to agree not to continue the offense.

The above agreement was adopted at that meeting, and was made possible by the presence of the delegates from the various retail organizations.

The ninth annual meeting was held March 6 and 7, 1901, at the Hotel Schenley in Pittsburg, Pennsylvania, and the association was the guest of the wholesale lumbermen of Pittsburg. The following officers were elected:

Robert C. Lippincott, president; Pendennis White, first vice president; Charles H. Bond, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

The officers of the association had again found that the Boston and Baltimore agreements were inadequate to meet the requirements of the classifications of the trade throughout the country. The various retail associations being represented by the usual delegates, there was adopted at this meeting what is known as the Pittsburg amendment.

THE PITTSBURG AMENDMENT.

Resolved, That whenever delay in establishing classification is caused by failure of any retail association to act in the manner provided for by the joint agreements, the secretary of the National Wholesale Lumber Dealers' Association shall—after thirty days shall have expired from the date of his original request for classification—notify the retail association so delaying that it (the retail association) has a further limit of ten days only.

Upon the expiration of the said ten days the secretary of the National Wholesale Lumber Dealers' Association may notify its members wishing classification that they may sell to the firm, or party under consideration, until such classification is established by joint conference, provided the classification of the National Wholesale Lumber Dealers' Association is that they are legitimate trade, but this shall not in any way be construed to apply to delays which may be caused by the National Wholesale Lumber Dealers' Association.

The relations of the members of the association with the retail trade, in accordance with the various agreements, made prominent the members of the association and their salesmen. The retailers asked for some means of recognition, and it was suggested by several that the association should adopt an emblem or insignia. The board of trustees during 1900 looked into the matter carefully and, believing the suggestions to be practical, appointed a committee and invited artists to submit an emblem. The drawing made by Raphael Beck was accepted, copyrighted and adopted, and gold buttons for the use of salesmen and members were patented and cuts made for the use of members in correspondence, etc.

The tenth annual meeting, March 5 and 6, 1902, was held in the assembly room in the Fine Arts Building in Chicago, Illinois, and the association was the guest of the lumbermen in the territory of Chicago and many points northwest of that city. At that meeting the following officers were elected:

Pendennis White, president; Lewis C. Slade, first vice president; Guy Gray, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

The fire insurance committee, finding that considerable had developed in the fire insurance question after the formation of the protective trust fund within the association, bent its support toward an organization known as "Lumber Underwriters at Mutual Lloyds" which had been

brought out during the year, with offices at 66 Broadway, New York City, which organization was writing insurance all over the country, making lumber its special line.

The eleventh annual meeting, March 4 and 5, 1903, was held at the New Willard Hotel, in Washington, the national capital, and the following officers were elected:

Pendennis White, president; Lewis C. Slade, first vice president; Guy Gray, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary; John J. McKelvey, general counsel.

Prior to this meeting the association had been entertained by the local wholesalers of whichever city it had visited. The trustees recognized that the entertainment afforded the members on this basis was becoming rather expensive to the wholesalers located at these various points and felt that the time had arrived when the association should stand the cost of its own entertainment. Therefore, it had been voted that special committees be appointed to take care of the entertainment, for which the members were to pay as individuals.

During the two years previous to this meeting there had been a good deal of confusion and apparent misunderstanding with numerous retail associations as to the workings of the agreements that had been made between the associations interested. It had been found that the same conditions did not prevail in all sections of the country and, therefore, that no hard and fast rule could be laid down by the national association that would meet all the requirements of the various retail associations. It was found, also, that several retail associations had raised the question of the legality of certain sections of the agreements, as they had been made, and seemed to feel that there was a question as to the advisability of continuing them. This, together with other points that had been raised by the retailers, as well as on the part of the association, led to an extended discussion regarding the question, and at the meeting a large percentage of the retail associations passed resolutions, which, when taken literally, abrogated the Baltimore and Pittsburg agreements.

These actions of withdrawal practically brought the trade relations question back to where it was before the Boston meeting, with the exception that a very small percentage of the retail associations did not acquiesce in the withdrawal, and consequently, so far as they are concerned, these agreements are still in force.

The fire insurance committee of the association still found the organizations inadequate to the demand for insurance at reduced rates, and lumbermen reorganized the Toledo Fire & Marine Insurance Company, which is practically controlled by members of the association, and encouraged similar efforts by suggesting the organization of other companies.

UNIFORM TERMS OF SALE.

The condition of trade throughout the country, the varied ways in which lumber was sold and the uncertainty of the establishment of a definite system of terms, so far as courts were concerned, encouraged the members to plan for uniform terms of sale, and at this meeting adopted what are appropriately known as the official terms of sale. They read as follows:

The terms hereon are those agreed on by both buyer and seller and are a part of the sale agreement.

Settlement to be made promptly on receipt of each car. Freight, net cash. Balance by note at sixty days from date of invoice or less 1½ percent discount for cash if paid within fifteen days from the date of invoice; or one percent for cash if paid within thirty days from date of invoice.

No discount allowed after thirty days.

If car is not received within the above discount times, and discount is desired, prepayment on account will not be held as acceptance of the shipment, and the right to make corrections and complaint will not be forfeited thereby. In making delivered prices, cost of goods delivered at destination is guaranteed, but not against delay in transit.

The twelfth annual meeting, March 2 and 3, 1904, was held at the New Willard Hotel in Washington, D. C., and the following officers were elected: Lewis C. Slade, president; Lewis Dill, first vice president; J. M. Hastings, second vice president; Frederick W. Cole, treasurer; E. F. Perry, secretary, John J. McKelvey, general counsel.

The association had found many difficulties arising over traffic questions and, while a special committee had had charge of this department of the work, no provision had been made on the part of the association for the establishment of a regular department for this particular problem. At that meeting the railroad and transportation committee was authorized to organize a transportation bureau, and during the year such a department was established with C. W. Throckmorton as traffic manager and with headquarters at 66 Broadway, New York City, using part of the association rooms. This department has since been doing good work along special lines, and is making a feature of the collection of railroad claims.

At the thirteenth annual meeting held March 1 and 2, 1905, at the Bellevue-Stratford Hotel in Philadelphia, Pennsylvania, the following officers were elected: President, Lewis Dill; first vice president, J. M. Hastings; second vice president, C. H. Prescott, Junior; treasurer, Frederick W. Cole; secretary, E. F. Perry; general counsel, John J. McKelvey.

The fourteenth annual meeting was held March 7 and 8, 1906, at the New Willard Hotel, Washington, D. C., and the following officers were elected: President, Lewis Dill; first vice president, J. M. Hastings; second vice president, C. H. Prescott, Junior; treasurer, F. W. Cole; secretary, E. F. Perry.

At this meeting an active membership of 366 was reported. A resolution was passed petitioning Congress to repeal pilotage discrimination against sailing vessels in the coasting trade.

FORESTRY RESOLUTIONS.

Resolutions in the interest of preservation of American forests were adopted as follows:

WHEREAS, It is becoming more and more evident that excessive or inequitable taxation of forests and forest lands is one of the chief reasons why lumbermen strip their holdings and why land owners generally find it difficult to maintain or grow forests for successive crops, and the situation demands careful and immediate consideration; therefore, be it

Resolved, That we herewith express our hearty appreciation of the efforts of the Forest Service in coöperating with the owners of timber lands in the introduction of practical forestry; also in aiding states to establish adequate policies and in extending and improving the national forest reserves.

Resolved, That the need of establishing national forest reserves in the southern Appalachian and White Mountain regions becomes more urgent daily. We, therefore, earnestly advocate the prompt passage by Congress of the bill pending, which will create these reserves and thereby not only preserve the natural resources of two exceedingly important regions, but also contribute largely to the stability of the national prosperity.

Resolved, That we recommend an increase for opportunities for general forest education in schools and colleges, and for professional training in postgraduate schools; and we earnestly request Congress to take favorable action at its present session upon the bill now pending, which appropriates funds for the promotion of forest education and forest experiment work in the agricultural colleges and experiment stations of the United States.

Resolved, That we urge upon Congress the repeal of the Timber and Stone Act, so long a source of fraud and loss to the Government, the immediate withdrawal from entry of all public timber land and the sale of the timber thereon at its market value under proper regulations.

Resolved, That this association protest against the attempt to reduce the area of the Minnesota National Forest Reserve and against any step that would render more difficult the perpetuation of the forest upon it.

Among other subjects to which the association gave its attention were governmental supervision of insurance, relations with the retail trade, national regulation of railway freight rates, methods and manner of securing concessions from the railroad companies of the United States by which the lumbermen should no longer be required, solely at their own expense, to equip flat cars with stakes and binders for properly securing lumber loaded thereon.

At the time of this fourteenth annual meeting the association had reached the highest point of efficiency in its career, the membership having reached 366, located in about one-half the states of the United States and in Canada.

The bureau of information had on hand over 19,000 commercial reports

regarding the commercial standing of that number of users and buyers of lumber.

The officers of the association at 66 Broadway, New York City, occupied a suite of six rooms, with an ample force of employees to carry on the work of the various departments.

The field of the association has been so divided that there were, at that time, four distinctive divisions or departments, with as many different heads of departments. These departments are known as (1) general association work; (2) bureau of information or credit department; (3) railroad and transportation or traffic department, and (4) the legal, or collection department. To these various departments all members of the association have free access except to the bureau of information which, owing to its confidential character, can be used only through its officials.

The finances of the association are maintained in excellent shape, while the total revenue and expenditures are approximately $25,000 a year. Membership in the association costs $50 a year, with an additional fee of $50 for members of or subscribers to the bureau of information. The offices in New York are centrally located and well equipped for the use of out of town visiting members.

The association is at the present time managed by a board of twenty-one trustees, which meets three of four times each year, and which delegates the constant management of the association to an executive committee of five, whose acts are practically those of the trustees, but which are subject to their approval.

The association is broad in its scope, handling all questions that are of interest to the wholesale lumber dealer. It has not changed its plan of organization or varied from the principles adopted at its first meeting in 1893. Probably no other mercantile organization in existence has been so able to adhere fully and consistently to "first principles," and at the same time keep pace with the ever changing conditions of trade. While its membership consists primarily of wholesale lumber dealers, its plan and scope are so broad that it fully meets the requirements of the wholesale manufacturer, or even the manufacturer who markets his lumber through its members.

In 1905 the association inaugurated the holding of midsummer meetings, the purposes of which are chiefly educational and to promote acquaintance among the members. That for 1905 was held in Ottawa, Ontario, and was largely devoted to forestry subjects.

Having thus departed from the thread of discussion concerning the changes in the retail market of New York City, to recount how certain of those developments led up to the organization of lumber associations, a return is made to the original subject.

OLD GRADES AND BUYING METHODS.

Not only has a great change taken place in local methods, but a no inconsiderable one in the matter of buying. The earlier yard dealers were compelled to go to the Albany and Troy markets where, in those days, instead of assorted lumber were found piled together all the thicknesses of each particular cut of lumber. The retail buyer would pick out a pile running largely to the kinds he wanted, and take it all, good, bad and indifferent; whereas, in later years, selling prices and the general use of salesmen have largely done away with the necessity of such buying trips, although some dealers still make occasional trips to the large nearby wholesale markets with incidental ones to the producing sections. The retailer now, however, makes his selection much the same as does his customer; that is, he takes just what he wants. Formerly, the buyer did his own sorting after the stock had been delivered to him; and, while this required good judgment on the part of the buyer in selecting stock which would sort up well, it netted large returns in the securing of bargains and in the sorting.

Again reverting to the white pine trade, an instructive comparison between present and former practices is found in connection with the subject of grades. It is interesting to note that when Troy and Albany were at their height as lumber centers, there were only four standard grades of pine, viz., good, fourths, selects and box. To the average present day lumberman all these terms but one are suggestive of what they imply in quality, but the term "fourths" would probably be meaningless to him. When, however, the inspection rules of those days are recalled, it is readily understood. "Good" lumber was perfect in every particular, while "fourths" comprised three qualities, each with certain imperfections, but all grouped together under that name, like the second, third and fourth clear of the western markets. These three added to the good, or first clear of the West, made four—hence, fourths.

The introduction of the traveling salesman was another factor in the evolution of the lumber business that, many of the old school think, did more to cut profits than anything else. While it relieved the buyer from the necessity of making trips to the wholesale markets, it likewise made it necessary for him to buy on the representations of the salesman, thereby eliminating the possibility of direct bargaining with the handler and the advantage of seeing in advance what he was to get. It soon became necessary for the retailer to add the salesman to his staff, and that functionary is now, probably next to the stock itself, the most important factor in both the wholesale and the retail trade. It is through him as an intermediary that the bulk of the business is done today in the Metropolitan District.

While these various features of the development of the lumber industry in the Metropolitan District are of absorbing interest to the student of the subject, the greatest changes have come about in the evolution and perfection of railroad and water transportation in all their branches. So far as the railroads as an important factor in the lumber trade of the metropolis are concerned, they are a matter of the present generation. In 1900 the railroads brought into the district over 310,000,000 feet of lumber, whereas many of the present generation remember the time when the railroads cut practically no figure in the lumber traffic. Now they are the final and most important link in joining the great eastern consuming markets with the ever receding sources of supply. One of the oldest members of the trade cites that, when he made his first trip to the metropolis, the middle part of the Hudson River division of the New York Central & Hudson River Railroad had not been completed, and although, of course, the foundation of this great line had already been laid and many parts, which now go to make up the whole, were then in operation, as a trunk line system or as a factor in the commercial life of the Metropolitan lumber district it was nil.

MODERN TRANSPORTATION AND THE MARKETS.

What a change a half century has wrought. The completion of the great trunk lines, four of which have terminals at the doors of the district, and other developments in the shipping trade by sea and land opened up to the metropolis and other eastern markets not only untold sources of supply for the future, but, likewise, were largely instrumental in the development and use of various kinds of lumber that were previously ignored as having no commercial value. It is, indeed, transportation which has played the leading role in the development of the lumber trade, as in all lines of commerce.

The yellow pine trade, for example, assumed no proportions until after the Civil War. In the earliest days of the industry, locally it was the custom to bring the logs to the New York market and saw them as needed for timbers and other construction work. Freights were high and quick shipments by rail or steamer, now the rule, were unknown, and the building trades were all supplied in this manner. It should not be surprising to learn that there were fifteen mills actively engaged in manufacturing yellow pine in the Metropolitan District in 1868, whereas at the present time there is none, the entire manufacturing branch of the business having gone South, through the conveniences and benefits bestowed by the evolution in marine and railroad facilities and methods. In those days one could be a yellow pine manufacturer in New York without even having seen a logging operation, whereas nowadays to be a manufacturer means to have a practical knowledge of all branches incident thereto.

White pine logs coming partly by way of the Susquehanna River, and Canadian logs coming by canal and the Hudson River, and hardwood logs from Ohio and other points, were also brought to New York and sawed up, although at heavy cost for transportation. The famous old Eagle sawmill, of Brooklyn, figured prominently for years in this trade. Freights were higher then than now and were a big item. One member of the trade remembers paying as high as $15 a thousand on timber so bought. Some return was secured, however, in the sale of slabs for fuel and other purposes, which brought as high as 1½ cents a running foot.

John Hagemeyer had a sawmill on Downing Street, New York City, in the '50's. It was considered the best sawmill in the city. A little later his brother, Melchior Hagemeyer, had a sawmill on Cannon Street. Another brother, who was a pioneer of this period, was George Hagemeyer, who was first employed by John and was later in partnership with Melchior. In 1862 George established a small yard on Attorney Street in New York. This yard grew to large proportions. Mr. Hagemeyer, who was the pioneer hardwood lumber merchant of New York City, developed a large business of this character, drawing his supplies from Virginia, Tennessee, Pennsylvania, New York, Indiana and Canada. He was the first man to quarter-saw oak, sycamore, cherry and birch, and was the man who introduced this product to the New York trade. After his death, June 14, 1892, the business was continued by his sons, George and Casper.

It might here be stated, on the authority of a present member of the lumber trade, that to the Metropolitan District belongs the honor of being one of the first to adopt the circular saw for transforming logs into lumber. This saw was one placed in the plant of the South Brooklyn Sawmill Company, Brooklyn. Circulars had been used previously for lighter work, but the old gate saws were still in general use for log sawing at that time. Progress has been so rapid that now the circular is regarded as more or less primitive in most modern mills, and is steadily giving way to the band. The first circulars were solid tooth saws, and it was their use for log sawing that brought about the invention and introduction of the inserted tooth circular saw, which, curiously enough, was also first used in the above mentioned mill. With the solid tooth circular it was a frequent thing to lose a tooth or two, as the practice of using spikes in rafting logs was then common. Necessity being the mother of invention and spikes being numerous, invention won the day, and the inserted tooth was soon a recognized necessity in that class of work.

It is claimed that the first band mill used in America for cutting logs was placed in a New York sawmill. This is the band mill installed in the hardwood sawmill plant of W. E. Uptegrove & Bro., at the foot of East Tenth Street. It was made in Paris, and is claimed to have been the

first ever installed in America for sawing logs. It, of course, incited much comment, chiefly adverse. It was brought over in 1868, accompanied by a French artisan, who set it up and showed its purchasers, Messrs. Rodman & Hepburn, predecessors of Uptegrove & Bro., how to run it. This French artisan, M. Blauplain, concluded to remain in the United States, and in 1905 was still in the employ of Uptegrove & Bro. The fact that this band mill is still in use is a striking evidence of the worth of the original workmanship; but what a wide range in the history of the lumber trade is comprised between the date of the building of this band mill, light and requiring most careful attention, and 1906, with its enormous band mills designed for the heaviest kind of work!

THE EASTERN SPRUCE TRADE.

The changes wrought by the evolution of transportation facilities, the necessity arising from the exhaustion or depletion of nearby supplies and the utilizing of various kinds of lumber previously ignored, brought the opening up of the great eastern spruce trade, with Maine and the eastern Canadian provinces as a base. While the manufacture of lumber in Maine had, of course, been carried on to some extent from the earliest days of its settlement, the traffic in eastern spruce destined for the Metropolitan District did not assume important proportions until about 1850. One of the first firms to send spruce to New York was Simpson, Clapp & Co., organized some time in the '40's, which firm is still in existence, although there is no one identified with it today bearing either of its component names. The traffic, which is entirely by water, was exceedingly light for years after it had actually begun, and even in 1850 shipments to an individual firm amounted to only about a cargo a month, cargoes in those days running from 95,000 to 125,000 feet, the latter being considered a big one. Nowadays cargoes of half a million to a million feet do not excite much comment. It was all random sawed stuff, then, and poorly manufactured.

In 1850 the following firms were engaged in the eastern spruce trade of the district: Simpson, Clapp & Co., Smith & Boynton, John Boynton's Sons, Jedd Frye & Co., Chase, Talbot & Co., Mayhew Talbot & Co. and Israel Snow. All of these firms have passed out of existence with the exception of Simpson, Clapp & Co. and Chase, Talbot & Co., the latter being today one of the foremost spruce commission houses in the district. Ephriam C. Gates, founder of the retail house of Church E. Gates & Co. and one of the pioneer manufacturers of Maine, is believed to have landed the first cargo of eastern spruce in the Harlem River section of the district, in 1851. Since the '50's the volume of business in eastern spruce has steadily increased until in 1900 (the latest year for which figures are available) the total receipts amounted to 111,000,000 feet of lumber and 176 cargoes of lath.

During the development of the traffic there were naturally many changes in the trade, but now there are fourteen commission houses with headquarters in the district, all the business being done through those houses by a special agreement. In later years, or since the discovery of the fact that wood pulp makes good paper, the supply of eastern spruce has been slightly and progressively diminishing each year, owing to the diversion of logs from lumber to pulp and the advantages accruing to timber holders through such diversion, with the result that the belief is current that the spruce lumber traffic will continue to decrease yearly unless prices shall advance to a basis sufficient to warrant the manufacture of lumber instead of the grinding of logs. A large quantity of West Virginia spruce has also come into the market since the advance in the price of eastern stock, as previously it was impossible for the West Virginia manufacturer to compete with eastern water shipments.

NORTH CAROLINA PINE.

The development in the use of North Carolina pine was but another instance of a demand fostered by the depletion of supply and advancing prices of lumber previously used, and is no less interesting. About the first sales were between 1875 and 1878, and for years thereafter its adoption as a general lumber commodity lagged. As a matter of fact, it has been only in recent years that it has occupied its present position as one of the woods most adaptable to general purposes. There are few, if any, members of the trade today who can not readily recall the time when one could hardly give away a cargo of North Carolina pine in the district, whereas the cut of 1903 is estimated to have been over 1,200,000,000 feet, of which 400,000,000 feet is said to have found its way to the Metropolitan District.

CYPRESS IN THE METROPOLITAN DISTRICT.

While, in colonial days, cypress was an esteemed building material it largely fell into disuse under the competition of white pine, so that the present trade is of comparatively recent origin. For many years a few heavy manufacturers along the south Atlantic Coast and in Florida did a steady trade in northern markets that could be reached by water; but it was not until the cypress wealth of Louisiana, about twenty years ago, began to be developed with energy that the eastern markets really awakened to its value, resulting in the great business of today. The Louisiana producers began an energetic campaign of education, sending competent men to interest architects and contractors, as well as lumber handlers, in the wood, establishing exhibits and in every way bringing it into notice. The growth in demand for old uses was rapid, new uses were found for cypress, and all producing sections shared in the benefits of this campaign. So great is the present trade that several yard concerns make a specialty

of it, one of them carrying regularly on hand from 30,000,000 to 40,000,000 feet, while it is an important part of the business of many wholesale and commission houses. The supply comes, chiefly by water, from both Gulf and south Atlantic Coast ports.

Since this reintroduction of cypress, innovations in the shape of new kinds of lumber have been frequent and numerous, and the trade is now beginning to employ the various varieties of gum, while the Pacific Coast products are fast assuming a prominent place in the average yard list.

LUMBER RECEIPTS OF THE METROPOLITAN DISTRICT.

Complete records of the annual lumber receipts of the Metropolitan District have never been kept. A few figures, however, are available, and are as follows:

Receipts during 1890 by railroad (all lines), 22,545 cars of lumber, containing 293,085,000 feet; via Hudson River and canals, 641,304,000 feet; southern pine, by water, 233,496,167 feet; eastern spruce, 151,430,000 feet; cypress, 231,000 feet, an aggregate of 1,319,546,167 feet of lumber.

During 1896 receipts were 15,558 cars of lumber (complete arrivals lacking), aggregating 248,928,000 feet of lumber; 3,596 cars of shooks, 71,920,000 feet; 839 cars of logs, equaling 8,390,000 feet of lumber; receipts via Hudson River and canals (estimated), 500,000,000 feet; southern pine, by water, 271,048,460 feet; 323 cargoes eastern spruce, 60,000,000 feet; 13 cargoes railroad ties, 2,600,000 feet; 104 cargoes of piling, 17,000,000 feet; 1,435,870 railroad ties, 50,000,000 feet; cypress, 3,108,382 feet; North Carolina pine (estimated), 125,000,000 feet; a total for 1896 of 1,357,994,842 feet of lumber or its equivalent, and millions of feet of miscellaneous goods, as lath, shingles, pickets, etc.

During 1900 receipts were yellow pine, by water, 337,791,803 feet; 370 cargoes of spruce, equaling 110,000,000 feet; 20,701 cars lumber, 310,515,000 feet; 1,196 cars shooks, 17,940,000 feet; 740 cars logs, 7,520,000 feet; via Hudson River and canals, 428,433,665 feet; cypress, 6,166,918 feet; railroad ties, 647,158 feet; North Carolina pine, other than reported (estimated) 350,000,000 feet, an aggregate of lumber or its equivalent amounting to 1,696,014,604 feet. The following shipments also were received but were not estimated in feet or included in above figures: 176 cargoes lath, 137 cargoes piling, 154 cars shingles, 2,716 cars staves, 553 cars heading, 13,467 bundles of shingles, 27,511,000 pieces of shingles and 17,528 cedar logs.

In explanation of the necessity of estimating North Carolina pine in the above figures it is to be noted that a large number of vessels sailing from Norfolk and other points outside of Georgetown or Wilmington, invariably report "to master" at Sandy Hook, or to the firm to which cargo is assigned. Hence, the kinds of lumber they carry are not noted

by the maritime reports. This is in a measure true of cypress also, although considerable cypress is represented in the car trade given in the 20,701 carloads of general lumber received, as it is obvious that there was much more than 6,000,000 feet of cypress received in New York during 1900.

The receipts of southern pine (probably including some cypress) by water for 1905 amounted to 460,668,263 feet, and in 1906 to 494,703,577 feet, according to the report of the Maritime Association of the Port of New York. In 1906 the leading ports whence the above receipts were shipped, with quantity, in feet, from each, were as follows: Brunswick, Ga., 40,931,873; Charleston, S. C., 46,731,731; Fernandina, Fla., 27,077,866; Georgetown, S. C., 61,444,180; Jacksonville, Fla., 107,483,547; Mobile, Ala., 18,892,998; New Orleans, La., 8,631,270; Norfolk, Va., 7,834,934; Port Arthur, Tex., 7,640,085; Ft. Loyal, S. C., 10,420,165; Savannah, Ga., 18,826,803, and Wilmington, N. C., 21,566,328.

Receipts, mainly from New England, of eastern spruce during 1906 were 278 cargoes lath; 688 cargoes lumber; 93 cargoes piling; total cargoes, 1,059.

Some miscellaneous receipts of lumber from the South between December 25, 1905, and December 25, 1906, were cedar logs, 5,219; cypress, 14,847,571 feet; lumber, 27,854,248 feet; piling, 15,290 pieces; shingles, 76,095,706 pieces; hewn ties, 2,800,082 pieces; sawed ties, 45,178,700 feet, and hewn timber, 40,917 cubic feet.

ASSOCIATION INSPECTION OF HARDWOOD LUMBER.

Shortly after the formation of the New York Lumber Trade Association, or, to be specific, December 14, 1886, the inspection committee, of which the late George Hagemeyer was chairman, submitted rules to the association to govern the inspection of black walnut, cherry, plain and quartered oak, ash, maple, birch, beech, chestnut and poplar. These rules were adopted as the official rules of the association. Later on, as the association grew in importance, rules were added for the inspection of yellow pine, the association adopting in their entirety the Savannah rules of 1883. Following this the association adopted rules for the inspection of cypress, following the official rules of the cypress association at that time. The rules have been revised from time to time as circumstances seemed to demand. In the following chapter is given a critical review of the hardwood inspection and trade customs of New York as they existed prior to 1890, with some description of the modifications made later; but a description of the system of inspection as in force in 1906 seems appropriate in this place.

The rules are applied in the New York market officially by a corps of licensed inspectors acting under instructions established by the inspection committee, which are as follows:

All inspectors acting under a license from this association are expected in all cases to meet their engagements, and, being unable to do so by sickness or otherwise, they are required to use all due diligence to secure satisfactory substitute, in order that all lumber may be inspected without delay or loss to the parties concerned.

In filling out their returns, inspectors are obliged to use an official blank, which may be obtained at the office of the association.

Inspectors licensed by this association shall only issue inspectors' returns on lumber when they have measured and marked the same in accordance with the rules as adopted April 13, 1904.

Inspectors of this association shall not be permitted to accept salaried positions with any firms which are not members of this association and in good and regular standing.

Rules for marking the following grades of hardwood lumber:

Firsts.—In all cases the contents shall be marked on the upper edge of the board or plank inspected.

Seconds.—Shall in all cases be marked on the lower edge of the board or plank inspected.

Rejects or common.—Shall in all cases be marked with a stroke (–) after the figures.

Saps.—Shall in all cases be marked with the letter "S" above the figures.

Culls.—Shall in all cases be marked with a half circle over the figures.

The inspection committee of the New York Lumber Trade Association is at all times ready to take up any complaint which any one may make against the official inspectors, as it is the intention and desire of the association that all its inspectors shall be men of integrity and inspect in accordance with its rules.

The inspection rules of the New York lumber trade now in force bear date of April 13, 1904, when they were revised. They are copyrighted and are published by the *New York Lumber Trade Journal*, by courtesy of which they are in part reproduced herewith. They are of such extent that it is not practicable to reproduce them entirely in this way. We content ourselves, therefore, with publishing the full rules for certain important woods and summarizing others. These rules are generally used in the Metropolitan market and prevail in default of any specific bargain of sale under which lumber is sold according to shippers' inspection or according to some other association rules. Outside of these official rules and of private inspection the rules most in use in the Metropolitan District are, for hardwoods, those of the National Wholesale Lumber Dealers' Association and the Hardwood Manufacturers' Association of the United States; for yellow pine, those of the Yellow Pine Manufacturers' Association, and for white pine, those of the Northern Pine Manufacturers' Association.

One of the most important portions of the New York hardwood inspection rules is contained under the heading "General Instructions." These are instructions to inspectors, and pronouncements of the association as to certain principles of inspection which apply to nearly all the different woods. Furthermore, they are substantially the same as the instructions contained in other local inspection rules, most of which were superseded

by rules of the National Hardwood Lumber Association, and, therefore, have historic value. These instructions are as follows:

GENERAL INSTRUCTIONS.

The question of determining the quality of lumber by grading and inspection is so much a matter of judgment, that the inspector must necessarily be guided in a measure by his own discretion, governed by the following rules:

Lumber must be inspected and measured as the inspector finds it, of full length and width. He shall make no allowance for the purpose of raising the grade. The inspection shall be made from the worst side of the board, except as otherwise provided by the rules.

Lumber should be well manufactured, of good average widths and lengths. It should be sawed plump and even thickness, and have parallel edges and square ends. Tapering lumber in standard lengths is measured at the narrow end.

In firsts and seconds, where the percentage of firsts and seconds is not agreed upon by the buyer and seller, they shall contain not less than 50 percent firsts.

A standard knot is not to exceed 1¼ inches in diameter, and must be sound.

Larger and loose knots grade the piece of lumber lower, in accordance with the judgment of the inspector.

Splits are not to exceed 12 inches in length in firsts, or one-sixth the length of the piece in seconds, in the aggregate, and not more than 25 percent of the whole in either quality may be so split.

Wormholes are not admitted in firsts and seconds, except as otherwise provided.

Shakes and heart boards and planks are not admitted in firsts, seconds or common.

Warped, twisted, flooded, stained, and stick-rotted lumber is marketable only by special agreement.

Thickness.—All lumber must be square edged and be full thickness when seasoned.

All badly sawn, missawn and uneven lumber shall be classed as culls, except when such will dress down the full length and width to the thickness below, in which case the piece shall be reduced one grade.

Lumber sawn for specific purposes, and dimension stock, must conform to the requirements of size and quality for the purposes intended, and be so inspected and measured.

Mill culls are not marketable, except by special arrangement.

Log run is understood to be the run of the unpicked logs, mill culls out.

Standard lengths are to be 12, 14 and 16 feet, admitting 10 percent of 10-foot lengths.

Standard lengths in walnut will admit 10 percent of 8 and 15 percent of 10-foot lengths, 8-foot lengths graded equal to firsts.

Cherry, plain and quartered oak, ash, birch, butternut and maple will admit of 5 percent of 8-foot and 10 percent of 10-foot lengths. All 8-foot lengths must grade equal to firsts.

Ash, oak and poplar squares will admit 10 percent 8-foot and 15 percent 10-foot.

Newels, from all kinds of timber, are to be cut outside the heart to square 4, 5, 6, 7, 8, 9, 10, 11 and 12 inches when seasoned.

Balusters.—To be cut exactly square, full size and clear, and to be 75 percent 32 inches long; 25 percent may be 28 inches long.

Explanation.—The term merchantable as used in these rules means that the percentage allowed must be free from rot, heart, shake, loose knots or worm defects.

In almost every hardwood the grades are four in number—firsts,

seconds, common and culls. Exceptions are found in beech, butternut, gum and plain-sawed sycamore, the grades in which are firsts, seconds and culls; chestnut—firsts, seconds, common, sound wormy and culls; quartered gum—firsts, seconds and common; poplar—firsts, seconds, sap clear, common and culls; quartered poplar—firsts, seconds and common; quartered sycamore—firsts, seconds and common. Firsts and seconds are usually combined in one grade, with a certain percentage of firsts, to be specified by special agreement, or, failing that, by the general instructions. Oak and poplar may be taken as characteristic of the inspection applied to the woods of strength and the light hardwoods, respectively. The full rules for these woods are as follows:

OAK (PLAIN).

Grades.—Firsts, seconds, common and culls.

Firsts.—Firsts shall be 8 inches and over in width. Eight to 10 inches wide shall be clear. Eleven to 14 inches wide will admit one standard knot or equal defect. Fifteen inches and over wide will admit two standard knots or equal defect.

Seconds.—Seconds shall be 6 inches and over in width. Six and 7 inches wide shall be clear. Eight to 10 inches wide will admit one standard knot or equal defect. Eleven to 14 inches wide will admit two standard knots or equal defect. Fifteen inches and over wide will admit three standard knots or equal defect.

Live sap allowed on one side, not to exceed one-fifth of the surface, if without other defects. A wormhole in plain oak shall be considered a defect equal to a standard knot.

Common.—Common shall be 5 inches and over in width. Five inches wide shall be clear. Six inches and over in width shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide.

Culls.—Culls include all lumber not equal to the grade of common, one-half of each piece being merchantable.

Other than as above stated shall be classed as mill culls.

Oak sawed through and through, not edged, shall be measured inside the wane, and tapering pieces are to be measured at the narrow end.

OAK SQUARES, 4x4 TO 10x10 INCHES.

Firsts.—Firsts shall be 8 feet and upward in length, sound and free from knots and checks, and of full size when seasoned. Splits to be measured off.

Seconds.—Seconds are to be sound and free from hearts, shakes and checks. Eight, 10 and 12 foot lengths admit one standard knot. Fourteen and 16 foot lengths admit two standard knots. Bright sap admitted.

Culls.—Culls include all squares not equal to the grade of seconds, one-half of each piece being merchantable.

Other than as above stated shall be classed as mill culls.

OAK, SHIPPING.

Shipping grade of oak to be a grade of firsts and seconds. To run 10 inches and over wide; 12, 14 and 16 feet long. To be free from hearts, shakes, rotten or loose knots, bunch or slug wormholes.

Square edge free from wane.

Scattering pin wormholes shall be admitted.

Splits, not to exceed 12 inches in any piece, will be accepted in this grade.

OAK, QUARTERED.

Grades.—Firsts, seconds, common and culls.

Quartered oak shall show some figure on one face.

Firsts.—Firsts shall be 6 inches and over in width. Six to 8 inches wide shall be clear. Nine inches and over in width will admit one standard knot or equal defect.

Seconds.—Seconds shall be 6 inches and over in width. Six to 8 inches wide will admit one standard knot or equal defect. Nine inches and over in width will admit two standard knots or equal defects.

A wormhole shall be considered a defect equal to a standard knot.

In firsts and seconds, one-half inch of bright sap allowed in widths running 6 to 8 inches. One inch of bright sap allowed in widths of 9 inches and over.

Common.—Common shall be 5 inches and over wide, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide.

Culls.—Culls shall be 6 to 16 feet, 3 inches and over wide, not over 10 percent to be under 5 inches, and shall include all lumber not equal to the grade of common, one-half of each piece being merchantable.

Strips.—Strips shall be 3 to 5 inches wide, shall be clear or clear one face. If tapering, to be measured at narrow end. Parallel edge strips shall be measured in ½-inch widths.

POPLAR (WHITEWOOD).

Grades.—First, seconds, sap clear, common and culls.

Firsts.—Firsts, 1 to 2 inches in thickness, shall be 8 inches and upward wide and clear up to 10 inches in width. Eleven inches, 1 inch of bright sap will be allowed. Twelve, 13, 14 and 15 inches wide, 2 inches of bright sap will be allowed, or one standard knot. Sixteen inches and over in width, 3 inches of bright sap will be allowed, or two standard knots.

Seconds.—Seconds, 1 to 2 inches in thickness, shall be 8 inches and upward in width, and at 8 and 9 inches wide will admit of one inch of bright sap, but no other defects. Ten and 11 inches wide will admit of two inches of bright sap or one standard knot. Twelve, 13, 14 and 15 inches wide will admit of three inches of bright sap and one standard knot, or two standard knots if there is no sap. Sixteen inches and over will admit of five inches of bright sap and one standard knot; if there is no sap, then three standard knots will be allowed.

Two and one-half inch and up, first and second poplar shall be 10 inches and over wide.

Three-eighths, ½, ⅝, ¾ first and second clear shall be 10 inches and over wide and contain not less than 75 percent firsts.

Sap clear.—Sap clear shall be sound, 5 inches and over in width, and free from all defects except bright sap.

Common.—Common shall include any width not less than 5 inches, and will allow bright sap or one-third discolored sap on one side. Two unsound knots will be allowed in this grade if over 12 inches wide, or one sound knot in excess of those allowed in seconds if without discolored sap, and straight splits not over one-third the length shall be allowed; otherwise lumber must be sound.

Culls.—Culls include all lumber not equal to the grade of common, two-thirds of each piece being merchantable.

Other than as above stated shall be classed as mill culls.

The principal variations from the inspections given above are as follows:

Ash: The inspection of firsts is the same as in oak, except that the words "equal defect" are omitted from the ash definition. They are also omitted from the definition of seconds, and the concluding paragraph in the oak definition of seconds is superseded in ash by the following: "Bright sap allowed in firsts and seconds." Common ash must be 6 inches and over wide, but otherwise the grade is the same as in oak. Ash strips 3 to 5 inches wide shall be clear on one side. Ash squares run from 4x4 to 12x12 inches, but the inspection is the same as in oak.

Basswood: The inspection of this wood is so different from poplar that it is given in full as follows:

Grades.--Firsts, seconds, common and culls.

Firsts.—Firsts shall be 8 inches and over in width. Eight to 10 inches wide shall be clear. Eleven to 14 inches wide will admit one standard knot. Fifteen inches and over wide will admit two standard knots.

Seconds.—Seconds shall be 6 inches and over in width. Six and 7 inches wide shall be clear. Eight to 10 inches wide will admit one standard knot. Eleven to 14 inches wide will admit two standard knots. Fifteen inches and over wide will admit three standard knots.

Bright sap allowed in firsts and seconds.

Common.—Common shall be 5 inches and over wide and shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear, in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide.

Culls.—Culls include all lumber not equal to the grade of common, two-thirds of each piece being merchantable.

Other than as above stated shall be classed as mill culls.

Beech: The grading is the same as plain-sawed oak except that bright sap is allowed in firsts and seconds and common is omitted, as is also the reference to wormholes.

Birch: This inspection closely follows oak but "one-third bright sap" is allowed in firsts and is not considered a defect in seconds.

Birch Squares: The inspection is the same as that in oak, except there is no cull grade and sap is not permitted except in sizes under 4x4.

Butternut: Firsts and seconds are the same as the corresponding grades in basswood, except that in firsts one inch of bright sap is an equivalent to one knot and no width more than one-fifth of the surface of seconds may be sappy. There is no common grade.

Cherry: Firsts and seconds follow the inspection of butternut except that the minimum width of firsts is 6 inches and that there is an additional paragraph as follows: "Gum spots shall be deemed a serious defect and, if excessive, shall lower the piece one or two grades." The common and cull grades of cherry are as follows:

Common.—Common 5 inches and over in width shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide.

Culls.—Culls include all lumber not equal to the grade of rejects, one-half of each piece being merchantable.

Cherry Squares: Substantially the same as oak, except that only two inches of sap on two corners is admitted in the grade of seconds.

Chestnut: The grading of firsts, seconds, common and culls is substantially the same as in plain oak, except that in widths 11 is substituted for 10, 12 for 11 and 16 for 15, and no reference is made to sap. The grading of sound wormy is as follows: "Sound grade of lumber 6 inches and over wide free from heart or shake defects. Wormholes allowed without limit."

Square Chestnut: The grades are merchantable and culls. Merchantable must be straight, sound, free from hearts and shakes; will admit two standard knots in 8 and 10 foot lengths, and three standard knots in 12, 14 and 16 foot lengths; one inch of wane on one corner, one-fourth the length; and wormholes not in excess of defects allowed for knots. In culls one-half of each piece must be merchantable.

Cottonwood: Firsts, seconds, common and culls are the same as corresponding grades in chestnut, except that common may have a minimum width of 5 inches.

Elm: Grades are substantially the same as in plain oak, except that in admitting knots one inch greater width is required at all specified widths above the minimum.

Gum: There is no grade of common. Firsts and seconds are substantially the same as oak with an inch greater width above the minimum width, with a provision that no more than one-fifth of the surface of one side shall be sappy.

Quartered Gum: In firsts 6 to 9 inches wide shall be clear, and 10 inches and over wide will admit one standard knot. In seconds 6 to 9 inches wide will admit one standard knot, and 10 inches and over wide two standard knots. Sap is not allowed in firsts and seconds. Otherwise the grades are similar to those of oak.

Hickory: The grades are like those of oak, except that 8 to 12 inches wide shall be clear and one inch greater width is required at other points above the minimum, and bright sap is admitted.

Hickory, Second Growth: The rule regarding this stock is as follows: "Sawed through and through and rough edged. Shall be measured inside the wane and in the center of the piece."

Maple: Grades are substantially the same as in oak with one inch greater width in allowing for defects at all points above the minimum.

Maple Squares: Has the same inspection as oak.

Poplar, Quartered: Three grades are provided—firsts, seconds and common. Firsts are clear in 6 to 8 inch widths and will admit one standard

knot or one inch of sap in 9 inches and over. Seconds in 5-inch widths shall be clear, and will admit one standard knot or one inch of sap in 6 to 8 inches and two standard knots or two inches of sap in 9 inches and over. Common is 4 inches and over wide, 8 to 16 feet long, not over 10 percent of 8-foot allowed; at 4 to 6 inches will admit two standard knots, and in 7 inches and over to cut 75 percent clear in not over two pieces. Bright sap no defect.

Poplar squares are 4x4 to 12x12 inches in size. Grading is the same as oak except that in seconds two inches of sap on two corners may take the place of knots.

Sycamore: In plain-sawed stock this wood takes substantially the oak inspection for the corresponding grades, except that one inch greater width is required for the admission of defects and a small amount of sap.

Sycamore, Quartered: Firsts 6 inches and over in width and clear to 8 inches; at 9 to 12 inches admit one standard knot or one inch bright sap; at 12 inches and over, two standard knots or two inches of bright sap. Seconds in 6 to 8 inches wide admit one standard knot; in 9 to 11 inches, two, and in 12 inches and over, three. Not over one-fifth of the surface may be sappy.

Walnut: The rules of this important wood are as follows:

Grades.—Firsts, seconds, common and culls.

Firsts.—Firsts shall be 6 inches and over in width. Six to 10 inches wide shall be clear. Eleven to 14 inches wide will admit bright sap on one side, not exceeding one inch in width, or one standard knot. Fifteen inches and over wide will admit bright sap on one side, not exceeding two inches in width or two standard knots.

Seconds.—Seconds shall be 6 inches and over in width. Six to 10 inches wide will admit one standard knot or equal defect. Eleven to 14 inches wide will admit two standard knots or equal defect. Fifteen inches and over wide will admit three standard knots or equal defect.

In any widths not more than one-fifth of the surface of one side shall be sappy.

Common.—Common shall be 4 inches and over wide. Four and 5 inches wide shall be clear, or clear one side. Six inches and over in width shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide.

Culls.—Culls include all lumber not equal to the grade of common, one-half of each piece being merchantable.

All other than as above stated shall be classed as mill culls.

Walnut Squares: The rules are substantially the same as those on oak, except that in seconds two inches of sap is allowed on one corner in short lengths, and three inches on 14 to 16 foot lengths.

LOG INSPECTION.

The rules of the New York Lumber Trade Association regarding the inspection of logs are those adopted June 26, 1889. The following are the "General Conditions":

To be fresh cut, and to grade firsts, seconds and culls. Are to be measured full at the smallest end, solid contents, if no other agreement is made between parties. Walnut and cherry, solid contents to be measured inside sap, all others to be measured from bark to bark. Standard lengths to be 10, 12, 14 and 16 feet, with not more than 20 percent of 10-foot lengths. In walnut, 8-foot lengths may be standard under the rules of walnut inspection. A standard knot is not to exceed 3 inches in diameter. Rotten and wormy logs are classed as culls.

Oak and ash must be 18 inches and over in diameter; firsts, 24 inches and over, sound, clear and straight, with one straight split admitted in one end. Seconds include diameters from 18 to 23 inches, to be sound, clear and straight; at 24 inches and over in diameter may have straight split on one or both ends not to exceed one-sixth the length of the log, or one straight split and one standard sound knot, or two standard knots without splits.

Poplar is to be 24 inches and over in diameter, with firsts 30 inches and over.

Cherry is to be 16 inches and over in diameter, with firsts 18 inches and over.

Maple, birch and beech are to be 15 inches and over in diameter, with firsts 20 inches and over.

Walnut is to be 16 inches and over in diameter, with firsts 22 inches and over.

Defects in all these woods are substantially the same as in oak and ash. In walnut shipping logs are "to be dressed to lines on four sides straight, with rounded corners."

The inspection charges made by the New York Lumber Trade Association for the services of its inspectors are, for walnut, ash, oak, cherry, gum, chestnut, hickory, birch, butternut and sycamore, fifty cents a thousand in single carload lots, and forty cents in two or more carload lots; for poplar, basswood, cottonwood, elm and beech, forty cents a thousand for single carload lots, and thirty cents a thousand in two or more carload lots. If two or more woods are in a single car the charge is fifty cents a thousand, and for logs, $1.

CHAPTER XXII.

NEW YORK—HARDWOOD INSPECTION.

Inspection of hardwood lumber in New York City and the Metropolitan District is under authority of the New York Lumber Trade Association, and has been so authorized for many years. The instructions, rules and comments thereon that appear in the following pages apply to the trade up to 1890. Some changes since have taken place which will be referred to and explained in the course of this treatment.

New York and the Metropolitan District constitute a great lumber consuming center, perhaps the greatest in the world. For many years it was the paramount hardwood and spruce lumber market in the country, and shared this preëminence without any appreciable rivalry. Its position was so commanding in this respect that the methods of handling, inspecting and grading in New York were the governing influences in the hardwood trade of the entire country.

Owing to the enormous demand for lumber in the Metropolitan District, for many years it has been the dumping ground of surplus stock, as Chicago is in the West. As one reviewer remarked in a letter on this subject in the early '90's, "New York is so persistently buried beneath a deluge of off-grade and frequently worthless stuff that dealers find difficulty in making a place for it. The demand for lumber is large in the aggregate and peculiar in detail, and the user of stock aims to make lumber conform to his purpose. The New York market is sometimes condemned without cause; and while it is true that the sharper is in the market, many of the disturbances in trade are due to ignorance on the part of shippers. It should also be remembered that there are sharpers in the woods as well as in the city."

It should be understood that the foregoing represents the view that was taken of the market in the time about 1890. Since then changes have taken place in the New York market that have tended to regulate, unify and harmonize the relations between shippers and receivers of lumber. The dissemination of knowledge, the increased intelligence of producers brought about by associations and the lumber press have bridged the chasm that once separated producers and city dealers, and now the combatants cross over the viaduct and mingle together in mutual understanding and coöperation.

The only published rules of inspection in the New York market are

those accepted by the Lumber Trade Association, but up to 1890 they had not generally been operative, as it was to a large extent recognized that the specifications were too severe for the seller of lumber. At the period indicated there were nine licensed inspectors, who were responsible to the association.

Nearly all the yard dealers employed inspectors, and the majority of the sales made were subject to the judgment of these men. Defects in lumber were searched for very carefully. The practice of marking off bad ends in lumber found no favor, and the practice was for the inspector to give full measure and then reduce the grade to balance the defect of the bad ends. In this way many carloads, while they overran in measurement, did not make a good showing as to quality.

These comments apply to lumber that was sold under the regular New York inspection; but many of the dealers, and a few of the manufacturers, purchased their lumber at the mills, and sent out inspectors to sort the lumber before shipment. Under such circumstances inspection became a matter of private agreement or contract.

The following fees were charged for inspecting the several kinds of lumber:

For walnut, ash, oak, cherry, gum, chestnut, hickory, birch, butternut and sycamore, 50 cents a thousand in one-car lots, and 40 cents a thousand for two or more carloads; poplar, basswood, cottonwood, elm and beech, 40 cents a thousand for one carload and 30 cents a thousand for two or more carloads. For mixed woods, when two or more kinds were in a car, the fee was 50 cents a thousand. The seller paid the cost of inspection unless it was otherwise provided for.

Taking the market as a whole, about two-thirds of the buyers paid cash for their lumber; when cash settlements were not made buyers gave ninety-day notes in settlement. These terms sometimes were varied by deducting $1\frac{1}{2}$ percent for cash, or the buyer gave his note for sixty days. Generally, the practice was to deduct the freight charge from the gross proceeds of the sale, and the cash discount was made on the net proceeds of the lumber; but a few buyers insisted on deducting the discount from the gross bill, and for that reason prudent shippers insisted on an understanding about the application of the discount.

When lumber was shipped to the New York market by any other line than the New York Central Railroad, the terminal was on the New Jersey side of the Hudson River, which involved delivery on the Manhattan side or in Brooklyn by lighters. The New York Central & Hudson River Railroad had three delivery yards, one at West Thirty-third Street, another at West Sixtieth Street, and one at Palmer's dock in Brooklyn.

Terminals of other railways centering in New York were as follows:

The Delaware, Lackawanna & Western, at Hoboken; Lehigh Valley, Pier 2, North River; Pennsylvania, Jersey City, also, at Pier 4, North River; New York, Lake Erie & Western, Jersey City, also at the foot of West Twenty-third Street, New York, and at Palmer's dock, Brooklyn; West Shore Railroad, Weehauken, New Jersey, and at West Twenty-third Street, New York. At the time mentioned the Pennsylvania was making arrangements to land cars at Palmer's dock, Brooklyn. The Baltimore & Ohio Railroad's terminus was at Communipaw.

The lighterage charge by this line was 4½ cents per 100 pounds, but to offset that expense the company made low rates from shipping points to the New York market. All the lines delivered lumber within a prescribed limit free of charge, provided the words "lighterage free" were inscribed on the bill of lading when the lumber was shipped. In case these words were omitted the railroads charged three cents per 100 pounds for lighterage, in addition to the regular tariff rate. When the car was billed "lighterage free" the consignee was notified on its arrival, and he then gave an order to the local agent to deliver to the place destined in the sale. The lighterage limits were as follows: On the North River side of New York, extending from Pier 1 to Seventy-second Street; on the East River side, from Pier 1 to Sixty-third Street; on the Jersey City side, from the National Storage docks to Oak Cliff; on the Brooklyn side of the East River, from the foot of Harsell Street to first bridge, Gowanus Street. The lighterage limits of Staten Island included only the American docks and Jewett's mills.

The charge for lighterage beyond the limits varied, and was based on the number of carloads to be delivered. The charge on from one to six carloads was $5; from six to ten carloads, $8. These prices were not for each carload but for entire lots.

At various convenient points there were storage yards conducted by private concerns, most of which carted and inspected lumber when desired. None of the railroads had facilities for storing lumber, hence when such a course became necessary the stock had to be carted from the place of discharge to the storage yard. The charges for the service were reasonable and varied but a trifle. They ran about as follows: Unloading, $3 a car; cartage, 50 cents to $1 a thousand; storage, 25 cents a month. The lumber generally was inspected as it was piled, and the other expenses were added to the inspection fee. When the lumber had been held in storage one year, and the charges remained unpaid, the storekeeper, under the law, had a right to sell it for the recovery of his charges.

There were three distinct branches of the trade in New York—the yard, the manufacturing or consuming trade, and the export business.

The interests of the yard trade were diversified. Some yard dealers

particularly catered to the building demand; others made a specialty of stock for the furniture, carriage, piano and kindred industries. As a rule, yard dealers were exacting in their choice of stock, since they were forced to cater to varied wants and their customers must be consulted as to sizes and qualities.

The export trade of New York was a branch of the lumber business that was tempting to many, some of whom dabbled in it only to become losers by their indiscretion. In handling export lumber purchases were made by foreign houses, some of whom acted as ship brokers. When an agent received an order from his principals he went on the market and bought from the concerns that dealt in shipping stock. In many cases a vessel would be waiting for a load, and the lumber had to be placed on board as soon as possible. When the lumber was shipped on order a time delivery was exacted, as the vessel could not wait. There was a specific grade for each of the foreign markets, and the details were only to be learned after long experience. It was deemed unprofitable to meddle with the export trade unless the shipper had a local yard, in which the stock could be sorted and the rejected stuff reserved for sale in the general trade. There were a number of dealers who made a specialty of the export trade, who went to the mills, where they made their selections and thus obviated the trouble and loss of handling a lot of rejects that they could not export.

In the New York market, as well as other eastern ones, after the supply of good white pine began seriously to decline, and the hardwoods to some extent supplanted it, the desire was that the pine standards of dimensions should be continued. Thus, 12, 14 and 16 foot lengths, which corresponded to the lengths of white pine commonly in use, were insisted on. While appreciating the fact that hardwood timber grew scatteringly, and often in extremely rough sections, topographically considered, from which it was difficult to secure and remove logs, it did not follow that the long continued customs in consuming markets were to be changed to meet all the changes in the forest conditions; though the history of all markets shows that the requirements in a measure do yield to the changing conditions of supply. But the New York dealers years ago continued to impress on the attention of producers that in order to secure the best results they must meet the demands of the market. They reminded the mill operators that so long as a few could cater to the best demand with the choicest material obtainable the consumer and dealer would continue to insist on long and well manufactured lumber. There was a limited sale of lengths under twelve feet, but the price of such short lumber was always relatively lower than that of the lengths twelve foot and upward.

It was insisted on in the New York market that all lumber should be

sawed plump thickness, with an allowance for shrinkage in drying. Boards were to be sawed not less than $1\frac{1}{16}$-inch thick, and plank up to and including two inches, should be one-eighth inch above specified thickness. There always was a prejudice in the eastern markets against thin lumber—that is, stock that was sawed scant—a prejudice that was much less pronounced in the western markets. If lumber arriving in the eastern markets was not full thickness in accordance with habituated requirements, it was measured into the next thickness below, which subjected the shipper to considerable loss.

Since it was considered impossible properly to inspect green stock all lumber was reinspected when shipped. It was enjoined that inspection should be in pieces, not by hundreds, and the invoice should give the number of pieces, of every thickness, length and grade, and it was thought good practice to give the number of pieces of every width.

HOW LOGS WERE PREPARED FOR MARKET.

The specifications as applied to logs for shipment to or through the New York market, in respect to quality and dimensions, were scarcely less severe for domestic use than when intended for export. For the last named purpose the logs had to be straight, free from large branch knots or rotten knots, heart checks or wind shakes, and not less than ten feet in length. A ten-foot log, if less than twenty-four inches in diameter, was liable to be rejected. Sawing trees to fell them was preferred to the use of an ax for the purpose. It was advised to saw the logs square off and that the ends should be painted. In case the trees were felled on the side of a hill it was insisted that care should be taken to have the logs sawed off square and not with a slant, as would be the case were the work done without care.

In certain foreign countries there was a duty on logs that were squared with a saw, and in such cases the work had to be done by hewing. After the sides of the logs were hewed or slabbed with a saw, the bark remaining on the corners was removed—peeled off, not cut away. It was deemed wise to cut logs an inch or two longer than the even foot, as that insured manufactured stock of full length. A log eighteen inches in diameter was faced from six to seven inches in width, and larger ones in proportion.

On every log it was required that an appropriate number should be placed, and a private mark fixed on the end either by stamp or paint. In making out an invoice every log was designated by number, with the length, diameter and contents given. It was considered advisable in the invoice to state the defects, if any, in each log. If a log were lost in transit or at destination it was readily recognized by the system of marking in vogue. If there were different systems of scaling logs in use the method employed should be stated in the invoice by the shipper. Any kind of a

log less than eighteen inches in diameter was not considered shippable. Poplar and oak logs were not to be less than twenty-six inches in diameter. Such remains the standard practice in the New York market.

NEW YORK INSPECTION IN THE EIGHTIES.

In considering the various kinds and grades of lumber handled in the New York market up to 1890, or later, together with the variety of uses in which they were employed, we have no other basis than the rules and regulations indorsed and sustained by the New York Lumber Trade Association, supplemented by current comment. In the following pages comparison is made with the rules adopted in 1904.

In a sort of preface to its rules the Association promulgated the requirements of the market in the following general instructions:

The question of determining the quality of lumber by grading and inspection is so much a matter of judgment that the inspector must necessarily be guided in a measure by his own discretion, governed by the following rules:

A standard knot is not to exceed 1¼ inches in diameter, and must be sound. Larger and loose knots grade the piece of lumber lower, in accordance with the judgment of the inspector.

Splits are not to exceed 12 inches in length in firsts, or one-fourth the length of the piece in seconds in the aggregate, and not more than 25 percent of the whole in either quality may be so split.

Wormholes not admitted in firsts and seconds except as otherwise provided.

Shakes and heart boards and plank are not admitted in firsts, seconds or rejects.

Warped, twisted, flooded, stained and stick-rotted lumber is not marketable.

Tapering lumber shall be measured one-third of its length from the narrow end.

Thickness—All lumber must be sawed square edged and be full thickness when seasoned. All badly sawed, mis-sawed and uneven lumber to be classed as culls.

Lumber sawed for specific purposes and dimension stock must conform to the requirements of size and quality for the purpose intended, and be so inspected and measured.

Mill culls are not marketable except by special arrangement.

Log run is understood to be the run of unpicked logs, mill culls out.

Standard lengths are to be 12, 14, and 16 feet, admitting 15 percent of 10-foot lengths; in walnut and cherry will admit 15 percent of 8 and 10 foot lengths, 8-foot lengths 12 inches and wider to be clear and graded as firsts, and 9 to 12 inches clear and graded as seconds.

Newels, from all kinds of timber, are to be cut outside the heart and to be clear, to square 5, 6, 7, 8, 9 and 10 inches when seasoned, and to be in lengths of four feet or any multiple thereof.

Balusters—To be cut exactly square, full size and clear, and to be 75 percent 32 inches long; 25 percent may be 28 inches long.

The foregoing were the instructions to inspectors authorized by the Lumber Trade Association in 1887, and which have been in force, with modifications, since then. In 1904 the Association adopted rules that in some particular show a considerable revision from those of former times.

Scanning these divergencies carefully we find that in the general instructions of the later period these paragraphs were inserted:

Lumber must be inspected and measured as the inspector finds it, of full length and width. He shall make no allowance for the purpose of raising the grade. The inspection shall be made from the worst side of the board, except as otherwise provided by the rules.

Lumber should be well manufactured, of good average width and lengths. It should be sawed plump and even thickness and have parallel edges and square ends. Tapering lumber in standard lengths is measured at the narrow end.

In firsts and seconds, where the percentage of firsts and seconds is not agreed upon between buyer and seller, they shall contain not less than 50 percent firsts.

These three paragraphs of instructions were not contained in the instructions to inspectors of an older date, as can be seen by a comparison with the text of the preceding copy of instructions.

Splits, in the old form of instructions, were not to exceed one-fourth the length of the piece in seconds, but in the new rules splits must not exceed one-sixth the length of the piece.

In the old rules, the name of "rejects" was given to the next grade below seconds; in the new rules "common" is designated.

In the later instructions the clause "except when such will dress down the full length and width to the thickness below, in which case the piece shall be reduced one grade" has been added to the old instructions about badly sawed lumber.

In the paragraph of the new instructions pertaining to standard lengths, 10 percent of ten-foot lengths is admitted instead of 15 percent as in the old rules.

The following paragraphs were introduced in the 1904 instructions that were not in the older ones:

Cherry, plain and quartered oak, ash, birch, butternut and maple will admit of 5 percent of 8-foot, and 10 percent of 10-foot lengths. All 8-foot lengths must grade equal to firsts.

Ash, oak and poplar squares will admit 10 percent 8-foot and 15 percent 10-foot lengths.

A slight change from the old instructions was made in the new ones concerning newels, and this "explanation" appears in the new instructions that was not in the old ones:

The term merchantable, as used in these rules, means that the percentage allowed must be free from rot, heart shake, loose knots or worm defects.

Following are the original association rules for grading hardwood lumber, interspersed with comments and explanations:

WALNUT.

Grades.—Firsts and seconds, rejects and culls.

Firsts.—Are to be 8 inches and over in width, 8 to 11 inches wide shall be clear; 12 to 15 inches wide will admit bright sap on one side not exceeding one inch in width,

or one standard knot, showing only on one side; 16 to 20 inches will admit of bright sap on one side not exceeding two inches in width, or two standard knots, showing only on one side.

Seconds.—Are to be 6 inches and over in width, 6 and 7 inches wide shall be clear; 8 to 12 inches will admit of one standard knot; 12 to 15 inches will admit of two standard knots; 16 to 20 inches will admit of three standard knots.

In any width, not more than one-fourth of the surface of one side shall be sappy.

Rejects.—Are to be 4 inches and over in width; 4 and 5 inches wide shall be clear, or clear on one side; 6 inches and over in width shall include all lumber not equal to the grade of seconds, two-thirds of each piece being merchantable; hearts, board or plank, not admitted.

Culls.—Are to include all lumber not equal to the grade of rejects, one-half of each piece being merchantable. All other than as above stated shall be classed as mill culls.

WALNUT JOISTS (OR SQUARES)—4x4 TO 10x10 INCHES.

Firsts.—Are to be 10 feet and upward in length, clear, sound and free from all defects, and of full size when seasoned.

Seconds.—Are to be sound and free from hearts, shakes and checks; 10 to 12 foot lengths admit of two standard knots and two inches of sap on two corners; 14 to 16 foot lengths will admit of three standard knots and two inches of sap on two corners.

These defects are based on 6x6 joist, and bear the same ratio in other sizes.

Culls.—Include all joists not equal to the grade of seconds, one-half of the piece being clear.

Other than as above stated shall be classed as mill culls.

In the old rules for the inspection of walnut, firsts were to be 8 inches and over wide; in the rules of 1904 the minimum width was placed at 6 inches, and the sap specification reduced the width of sap from two inches to one inch.

The term "rejects" used in the old rules became "common" in the new rules.

The old term for squares in the New York market and inspection rules was "joists;" in the rules of 1904 the term "squares" is used. The minimum length of squares in the new is 8 feet, in the old rule it was 10 feet.

Walnut lumber up to about 1890 was an important feature of the hardwood trade throughout the country, and it was especially so in New York, where both domestic and export trade were handled by the dealers. A man of experience in the hardwood trade in 1889, thus commented on the conditions pertaining to walnut stocks and trade, which may be of historical value as showing the magnitude, importance and diversity of the walnut business when it was still able to secure an ample supply:

In certain lines of furniture, mostly cheap goods, walnut is used extensively, but for such the demand is almost entirely for rejects and culls. For desk work, brackets, book cases, tables, chairs and picture-frame moulding, walnut is still a favorite wood. The thickness most in demand is one inch; probably three-fifths of all the walnut used in New York is of that thickness. The next best thickness is 1¼-inch, then 1½-inch. There is very little sale for 2-inch; but 2½-inch and 3-inch always find a ready sale.

In thin stock, which should be band-sawed, there is always a sale for $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ inch, and clear walnut in these thicknesses will yield better results than thicker stock. A few manufacturers who make special lines of goods, purchase dimension stock, that is, lumber cut to special sizes, bundled and shipped ready for dressing and joining. In this way only clear stock is bought, and there is a very small waste of material. It is a feasible and desirable way of disposing of culls.

The idea that walnut shippers consist only of wide, clear lumber, is only half correct. The stock must be wide, but not necessarily clear. The general specifications are 10 inches and over wide, 12 feet and up long, and free of shakes and splits. The quality is not apt to be as good as demanded by home buyers, as pieces containing several large, sound knots will pass as good, if the width is all right and the stock free of splits. By the association rules of inspection, such pieces would class as rejects, if not culls.

Counter tops must not be less than 20 inches wide and practically perfect. The standard lengths are 12 to 18 feet, and thickness 1 to $1\frac{1}{4}$ inches, with calls for the inch predominating.

Balusters must be sawed perfectly square, and in sizes of $1\frac{1}{2}$x$1\frac{1}{2}$, $1\frac{3}{4}$x$1\frac{3}{4}$, 2x2, $2\frac{1}{2}$x$2\frac{1}{2}$, 3x3 and 4x4. Lengths must be 28 and 32 inches, in the proportion of one-fourth 28 inches to three-fourths 32 inches. The quality must be perfect, and every piece perfectly straight. The pieces above 4 inches are called newels, the standard sizes for which are 5x5, 6x6, 7x7, 8x8, 9x9, and 10x10 inches, in lengths of 4 feet, or multiples thereof. Very salable lengths are 12 and 16 feet. As with balusters, the quality must be perfect and absolutely free of heart and cracks. In walnut a soft, straight-grained wood takes preference over hard, knurly wood, or the mongrel, known as "blue-grass" walnut.

Walnut, in common with other kinds of hardwood lumber, is measured as the inspector finds it, and the system of marking off defective ends or edges, to make a piece good, is not in practice in the New York market. All lumber is measured for its contents and graded accordingly. Disregard of this rule has frequently led to losses.

It is an unwritten law in the market that prices quoted or offered are based on stock that runs not less than 60 percent firsts and the balance good seconds. Firsts, according to the rules, must be 8 inches and over wide, and seconds 6 inches and over. Pieces 6 and 7 inches wide must be clear, to grade even as seconds. This definition clearly decides the destiny of strips that come from either side of the heart.

The value of walnut depends much upon the average width. A carload may be made up of 6 to 12 inch widths, and grade 60 percent firsts, and still not command the full market price. If it is evident to the buyer that the wide lumber has been sorted out, the value of the remainder is problematical. The custom is to represent good walnut as running 6 to 18 inches wide, and a fair amount of widths above 12 inches must be shipped to fill such a bill, otherwise the full market price can not be obtained.

As a rule 12-foot walnut, by itself, will not command as high a price as that 14 or 16 feet long, or as much as the three lengths combined. The exception is when the stock is intended for manufacture into mouldings, for which purpose the grain must be soft and straight.

Dry walnut is far preferable to green, and will always command a much better price, no matter what the quality may be. The ends should be sawed square and with a saw having very little set, so as to leave the grain smooth. Walnut with ragged ends is indicative of carelessness in other respects, and a sale may be blocked by such a defect. Soft, straight-grained walnut of a medium chocolate shade is perferable to very dark hard-grained stock. The latter is especially desirable for certain purposes, such as gun-stocks, arms and seat-frames for chairs and small panels. When manu-

factured for such purposes the returns are better than when sold as a whole, as the stock then becomes a specialty while otherwise it is usually rejects or culls. Of course, it requires special machinery—not necessarily expensive, however—to convert the stock into dimension sizes; but it will pay.

The above is an accurate and comprehensive review of conditions governing the New York walnut market when it was at its prime.

POPLAR.

Grades.—Firsts, seconds, common and culls.

Firsts.—Are to be 10 inches and over in width; 10 to 12 inches wide, shall be clear and sound; 13 to 15 inches wide will admit of one inch of bright sap showing only on one side; 16 to 20 inches wide will admit two inches of bright sap showing only on one side, or one standard knot showing only on one side.

Seconds.—Are to be 8 inches and over in width; 8 inches wide shall be clear; 9 to 12 inches wide will admit of two inches of bright sap or one standard knot; 13 to 15 inches wide will admit of three inches of bright sap, or two standard knots; 16 to 20 inches wide will admit of four inches of bright sap, or three standard knots.

Common.—Is to be 5 inches and over in width; 5 and 6 inches shall be clear; 7 inches and over in width include all lumber not equal to the grade of seconds, two-thirds of each piece being merchantable, or will admit of one-third the surface discolored sap, or all bright sap boards, when otherwise free from defects.

Culls.—Include all lumber not equal to the grade of common, one-half of each piece being merchantable. Other than as above stated shall be classed as mill culls.

SQUARES—4x4 TO 10x10 INCHES.

Firsts.—Are to be 10 feet and upwards in length, sound and free from all defects, sawed square, and of full size when seasoned.

Seconds.—Are to be sound and free from hearts, shakes and checks; 10 and 12 foot lengths admit of two standard knots or two inches of sap on two corners; 14 and 16 foot lengths admit of three standard knots or two inches of sap on two corners; these defects are based on 6x6 joists, and bear the same ratio in other sizes.

Culls.—Include all joists not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

LATER POPLAR RULES.

In the old rules the grades of poplar were firsts, seconds, common and culls. In the newer rules "sap clear" has been introduced, which is designated as sound lumber, five inch and over in width and free from all defects except bright sap.

The old rules required poplar firsts to be ten inches and over in width; the later rules make the minimum width requirement only eight inches. The requirement in respect to the admission of sap is less stringent in the recent rules than in the older ones. The rule in respect to width, sap, etc., in seconds has not been materially changed for many years, but the recent specifications are more elaborate as to seconds than the old ones, in respect to sizes and defects. The specifications applied to the common grade have also been considerably changed in recent years.

There is a section in the rules of 1904 designated as "Poplar, Quartered," which was not in the rules fifteen years before.

In respect to poplar squares the minimum length in the new rules is eight feet; that in the old rules was ten feet. Splits in the new rules are to be measured off; no mention of this item is made in the old rules. In other respects the rules applicable to squares have not been much changed.

POPLAR CONDITIONS IN THE EIGHTIES.

The following elucidation in respect to poplar applies to the conditions between 1880 and 1890:

To enumerate even the leading uses for poplar would occupy considerable space; it would require much less to present a list of industries where the wood is not poplar. It has walked all over white pine, so to speak, and made its mark where several other woods have long held complete control. A few years ago poplar was, in the estimation of architects, house owners and builders, totally unfit for interior or exterior trim. Few door makers considered the wood of any value, the allegation being made that it would warp, twist, shrink, and refuse to hold paint. It would hold paint, however, much better than the theory would hold water. In many houses, both cheap and otherwise, we find that poplar trim has almost entirely superseded pine. A large portion of the doors made in the East are of poplar, and the wood is the salvation of furniture and cabinet-makers whose demand frequently calls for cherry finish, a specification which is filled in part by the real wood and the remainder with poplar artistically stained. For mouldings it is a standard wood, and meets with large sales for that purpose. Boxmakers are using it to some extent, and for a thousand and one small articles poplar is employed on account of its cheapness, quality and durability.

In addition to the four grades enumerated, the trade is fed with stock known as "clear sap." It really comes under the head of common, but that grade is composed of knotty as well as discolored sappy pieces, and neither will sell as readily or at as full a price as the "clear sap." Sap common can be cut up without waste; knotty stock may run wider and contain a certain amount of better quality wood, but the waste and cost to cut it up are against its sale. Stained sap is a serious defect.

To obtain the best price, widths in boards must run 10 inches and over, and contain a good proportion of pieces from 20 to 30 inches. There is a sale for poplar running 8 inches and over; but if there is a noticeable amount of 8-inch pieces, the price is affected from 50 cents to $1 a thousand, even though the quality is otherwise standard. Plank should run 12 inches and over. In thin stock the widths should average wider than in boards, as the stock is largely used for panels. For car panels the widths must run 17½ to 23½ inches and 18 to 20 feet in length. In some cases carloads, all of one width—say 22 inches, and every piece 18 feet long—are furnished, such stock commanding a high price. The best length is 20 feet. Coach panels are required to be 30 inches and over wide, and any length from 10-foot up is salable. The stock need not be clear; but defects must be so located that in clear pieces the full width can be cut out.

Coffin stock must be ¾ inch thick and all 14 feet long. Each carload should run 12 inches and over, with one-half 21 inches and over. The quality must be about all firsts. The largest consumers in New York usually make contracts for delivery. As a rule it is risky business for a novice to consign coffin stock. Consumers are very particular, as the severe competition among casket manufacturers compels them to produce perfect work, as much of the wood is stained and made to represent more costly woods.

Standard lengths in poplar are 12, 14 and 16 feet. Long lengths sell most readily

and command the best price. Many buyers will not use all 12-foot stock, while the trade generally pays less for that length than for longer. A carload of wide stock made up of about equal amounts of 12, 14 and 16 foot lengths would probably bring full price; but if there is an excess of 12-foot pieces the value is lessened. The best price is obtained for 14 and 16 foot stock.

For door work the best length is 14-foot, and the poorest 12-foot. A great many stock, or regular size, doors, are 6 feet 8 inches long, and 14-foot lumber cuts to best advantage, whether used for doors or door frames. For mouldings 12-foot lumber is used principally, although all the other lengths sell to a limited extent. No difficulty is ever met in selling 14 and 16 foot lengths; but it often bothers a seller to dispose of 10 and 12 foot lengths, even though of choice quality.

The unwritten law of the New York market, regarding the standard grade of the various thicknesses of poplar, is as follows: Boards must inspect not less than 65 percent clear and the balance good seconds. Thicknesses above boards must be 75 percent clear, and below inch 80 percent. These are the minimum proportions, and shippers, to obtain the best results, must exceed such percentages, especially in the thickness below inch, where the wood is used for coffin, car and carriage work, which requires almost perfect lumber.

Export stock runs largely to inch, the requirements being 14 inches and over wide and 12 feet and up long. Besides inch there is a limited demand for 3 and 4 inch, the requirements for widths and lengths being the same as for inch. In $\frac{5}{8}$-inch, sales are made of stock running 30 inches and over, and cut into lengths of 6 feet. Export stock must be absolutely free of splits and cracks.

Common poplar is used principally by cabinet and furniture makers and others who cut up stock for various purposes. Sap stock is used for work where the wood is not exposed; also for drawers, and when the wood is to be stained. A grade of common, which consists of knotty stock, where clear yellow wood can be cut from between such defects, is made to serve the purpose of the best quality, although many users claim that the waste more than offsets the saving in price; hence, sap common sells more readily and commands a better price than knot common. The demand is principally for inch, although other thicknesses up to 2 inches are called for, and would no doubt be used extensively if the grade was abundant in such thicknesses.

Quarter-sawed poplar is used almost entirely for a body on which to veneer, such as piano cases. While the wood is known as quarter-sawed, much of it is obtained from each side of the heart by the ordinary means of sawing. Such stock, according to the rules, would grade largely as common, but, when sorted and sold as quarter-sawed, for the purpose named, becomes a specialty, and commands almost as high a price as wide, clear lumber.

The amount of rift grain poplar, produced in the ordinary way, is not sufficient to meet the demands of the piano trade, and the veneer mills in New York consume a great many logs in the manufacture of quarter-sawed stock. It is probable that many millmen who read this may never have heard of the use of rift, or quarter-sawed, poplar.

Poplar squares are used in sizes of 4x4 to 10x10 inches, with calls for 5x5, 6x6 and 7x7 predominating. Squares are used for such purposes as pump stock, rolls for cotton machinery, posts for outside porches and cheap newels. The quality must be practically perfect, or at least entirely free from splits, checks, surface cracks and heart. Sap on the corners that will not turn off when the piece is turned to full size, will condemn it.

In all grades and thicknesses of poplar, smooth-sawed stock having even, smooth-

sawed ends, sells the quickest and gives the best satisfaction. It is a wood that is improved or injured a great deal simply by the way in which it is manufactured, and too much attention can not be paid to that feature. The lumber should be loaded carefully, and one piece should never lap over another. No wood is more liable to injury by handling, hence, shippers should avoid a transportation line by which consignments are rehandled while in transit. The bill of lading should read, "deliver in bulk, lighterage free." A gang of careless railroad or lighter employees will injure a consignment of good poplar many dollars' worth by rough handling, for which there is no redress.

The old New York Lumber Trade Association rules for the inspection of cherry, except for joists, or squares, are as follows:

CHERRY.

Grades.—Firsts, seconds, rejects and culls.

Firsts.—Are to be 8 inches and over in width; 8 to 10 inches wide shall be clear; 11 to 14 inches wide will admit of bright sap on one side not exceeding one inch in width, or one standard knot showing only on one side; 15 to 20 inches wide will admit of bright sap on one side not exceeding two inches in width, or two standard knots, showing only on one side.

Seconds.—Are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 10 inches wide will admit one standard knot; 11 to 14 inches wide will admit of two standard knots; 15 to 20 inches wide will admit three standard knots; in any widths, not more than one-fifth of the surface of one side shall be sappy; gum spots shall be deemed a serious defect, and, if excessive, shall lower the piece one or two grades.

Rejects.—Are to be 5 inches and over in width; 5 inches wide shall be clear or clear one side; 6 inches and over in width shall include all lumber not equal to the grade of seconds, two-thirds of each piece being merchantable; heart boards or plank, not admitted.

Culls.—Include all lumber not equal to the grade of rejects, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

Strips.—Three to 7 inches wide shall be clear or clear faced—the reverse side will admit of one-third sap or one defect.

The rules concerning cherry published in 1904 change the term "rejects" to the name "common." The minimum width of firsts in the old rules was 8 inches; in the new rules it is 6 inches, and the like concession is made as to the admission of sap. Little change was made in the specifications applicable to seconds, except that gum spots were made a serious defect. The specifications concerning cherry strips are more elaborate in the new rules than in the old ones.

The following remarks apply to cherry in the '80's, when it was in abundant supply and there was a large trade in it:

Cherry, like mahogany, is in the midst of its era of popularity. During the last decade it has been looked upon as a somewhat unpopular wood, and from that position it has risen almost into the realm of fancy woods.

Until 1885 it grew in public favor at a rapid pace; then it received two severe blows, from which it has never fully recovered. The insane habit of staining the wood almost beyond recognition became revolting to refined tastes, and, somewhat suddenly, the inventors of certain fashions recommended mahogany, to the exclusion of cherry.

Ordinarily, this would have been a severe blow to the industry, but about that time it became evident that the slaughter of cherry timber during the preceding five years had materially lessened the supply of raw material, and the manufacturers, although facing a declining demand, fully comprehend that all the cherry lumber which it was possible to produce would find a ready market. The curtailment of demand was less than the diminution of supplies, and the trade in one sense was better off than when cherry was booming, as the manufacturers had the opportunity and power to advance prices and now the average millman places a price upon his product that debars many yard dealers from carrying anything like an assortment. This has led to a closer relation between the consumer and producer, and fostered a feeling of enmity between the producer and the yard dealer.

Thicknesses of cherry used in the New York market range from $\frac{5}{8}$ of an inch to 4 inches. Sales are also made of thicknesses above 4 inches, such stock generally going to veneer mills to be resawed into very thin stock. There is not much demand for $\frac{5}{8}$-inch. Boards are always salable, especially if of a wide run and choice quality. Probably three-fifths of all the cherry used in New York is inch. The next best thickness is $1\frac{1}{4}$-inch. There is little sale for 2-inch, and $1\frac{1}{2}$-inch has few calls.

Width is an important factor in the sale and price of cherry. It has always been a rule with millmen to saw the largest and best logs into plank. The following of such a rule causes a stock of boards to run narrow and generally inferior in quality.

There is a sale for strips, which include pieces that run from 3 to 7 inches wide, and have one clear face. The back side, according to the rule, may be one-third sap, or with equivalent defect.

The length of cherry lumber has much to do with the price. Long lengths are always salable. Short stock—10 and 12 foot, especially in 10-foot—requires forcing. Three and 4 inch plank will sell best in 16-foot lengths. Such thicknesses are used for stair rails, where length is an important item. The association rule is to admit 15 percent of 8 and 10 foot lengths in every carload.

The quality of cherry is based on old-growth timber. There are many consumers who will not use second growth under any circumstances. The wood runs clear and free of gum, but the grain is hard, and frequently has but little color. For many purposes birch would answer equally as well and be less expensive than second growth cherry.

The most prominent defect in cherry is gum. Whether in the form of specks or blotches, it is strenuously objected to, still it would be difficult to find a first-class piece of work in any market, where this alleged defect, which is but the handiwork of nature, can not be found. A gum blotch is an entirely different species of defect. It is larger than the "speck" and soft in its nature, hence can not be polished. The gum blotch must be cut out and thus creates a waste; but it is not so with the magnified speck, which can be, and is, polished over, and is an affidavit, in these days of stained imitations, that one is looking at genuine cherry.

The decreased sale for cull cherry has led to the equipment of factories for the preparation of piece stock. Nothing goes to waste about such a factory. A few good men do the overseeing and boys can easily do the bulk of the work. The uses for piece stock are too numerous to mention, but one can readily enumerate such items as chair frames, parts of desks, slate frames, type cases and various parts of cabinet organs.

CHERRY JOISTS—4x4 TO 10x10 INCHES.

Firsts are to be 10 feet and upward in length, clear, sound and free from all defects, and of full size when seasoned.

Seconds are to be sound and free from heart, shakes and checks; 10

and 12 foot lengths admit of two standard knots and two inches of sap on two corners; 14 to 16 foot lengths will admit of three standard knots and two inches of sap on two corners. These defects are based on 6x6 joists, and bear the same ratio to other sizes; gum spots not admitted, except where very slight.

Culls include all joist not equal to the grade of seconds, one-half of each piece being merchantable. Other than as above stated shall be classed as mill culls.

In balusters the best demand is for 1½x1½ and 2x2. Furniture and cabinet makers use more or less 3x3 and 4x4. Newels sell best in sizes of 5x5, 6x6 and 7x7. Such stock should be in lengths of 4 feet, or a multiple, such as 8, 12 or 16 feet. Heart is absolutely excluded from all square stock, and every piece must be straight. Twisted or bowed squares are worthless. Balusters up to 2x2 inch should be bundled; it insures accuracy and speed in counting.

The inspection for ash, as adopted by the Lumber Trade Association in the late '80's, was as follows:

ASH.

Grades.—Firsts, seconds and culls.

Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side; live white sap allowed.

Seconds are to be 6 inches and over in width; 6 to 7 inches wide shall be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots.

Heart or doted boards and plank will not be admitted in firsts and seconds.

Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

Strips 4 and 5 inches wide shall be clear or clear one side.

JOISTS—4x4 TO 10x10 INCHES.

Firsts are to be 10 feet and upward in length, clear, sound and free from all defects, and of full size when seasoned.

Seconds are to be sound and free from heart, shakes and checks; 10 to 12 foot lengths admit two standard knots; 14 to 16 foot lengths admit three standard knots; bright sap admitted; the defects are based on 6x6 joists, and are to bear the same ratio in other sizes.

Culls include all joist not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

Second growth ash, sawed through and through and rough edged, shall be measured inside the wane, and in the center of the piece.

The old rules of inspection as applied to ash lumber made but three grades—firsts, seconds and culls; the more recent rules make four grades by adding "common." In the old rules clear lumber had to be free from defects up to 12 inches wide; in the new specifications the limit for clear is 10 inches. In the old style, widths 16 to 20 inches admitted two standard knots; in the new, 11 to 14 inches admit one standard knot, and 15 inches, two standard knots. There are slight changes in seconds between the old and new rules. Specifications in respect to the common grade

in the 1904 rules were, of course, absent from the earlier specifications. There are also specifications about strips in the more recent rules that were not included in the earlier. The tendency in recent times has been to lower the grades—that is, admit more defects in narrower lumber—and to elaborate the specifications so as to cover a wider range of manufacture.

In the old inspection, also, there were rules for grading ash squares, or "joists," as they were then called. Such specifications do not appear in the later rules.

The following comments on ash were published when the old rules were in vogue, and express the state of supply and demand at that time:

In presenting the practical side of the New York market, in the distribution and consumption of ash, our comments will be confined to two species of the wood—white ash and brown ash; or, to use local phrases, the western white ash and Canadian, or Michigan, brown ash. Both species are used for house finish and furniture, and, as in all other kinds of hardwoods, the heaviest consumption is in boards.

As a rule, Canadian and Michigan ash is used for wainscoting and various articles of furniture, particularly chamber sets.

In practical use there is no sale for ash in the New York market below a good second. The inspection does not specify a grade of rejects; hence, any piece poorer than a second is classed as a cull, and is practically valueless, as there is not a use for that grade. Strips, which include pieces that are clear one side and 4 and 5 inches in width, are used for wainscoting and flooring. When dressed such stock must be absolutely clear face.

Up to within a recent date the New York dealers did not look favorably upon southern ash. Some time ago, when the millmen of the West undertook to boom the price of their product, the opportunity was embraced to experiment with the southern wood. The result was that prejudice has given way to common sense, and now a large quantity of southern ash is being distributed in that market.

In the export trade the call is for all thicknesses except 1¼-inch. Export stock runs from 10 inches up in width and 12 to 16 feet in length. A piece 9¾ inches wide will not pass, and this rule should be well impressed upon the minds of shippers. "Shippers," which is only a technical term for export stock, must be sound and free from shake, cracks and splits. A large sound knot will pass where a perfectly clear piece that is split twelve inches would be rejected. While 12 and 14 foot stock is salable for export, the best price and quickest sale is for 16-foot, and long lengths are especially desirable in 2½, 3 and 4 inch plank.

OAK.

Throughout the civilized world, except in extremely hot countries, one or more species of the oak is found. In this country oak forests abound in almost all the southern and central states. In species there are so many that even experienced lumbermen are frequently perplexed to designate correctly the class to which a sample piece of the wood belongs. Ordinarily, in the yard trade but two kinds are known—white and red. Among shipbuilders, carriage-makers and machinists may be found live oak, a species of the wood that is peculiarly adapted to purposes where great strength is necessary.

The early rules adopted by the New York Lumber Trade Association for the inspection of plain oak were as follows:

PLAIN-SAWED OAK.

Grades—Firsts, seconds and culls.

Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side; live sap admitted on one side, not to exceed one-tenth of the surface if without other defects; wormholes not admitted.

Seconds are to be 8 inches and over in width; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots; live sap admitted on one side, not to exceed one-fifth of the surface if without other defects; wormholes are serious defects, and should cull any piece where enough appear to equal one or more standard knots, according to width of the piece.

Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

Oak sawed through and through, not edged, shall be measured inside the wane, and tapering pieces are to be measured in the center.

The rules in force in 1904 in respect to oak show that within fifteen years, dating from 1888, there had been a considerable change in judgment or policy about the grading of that kind of lumber. In the first place the "common" grade has been introduced where it formerly did not appear. The introduction of a grade so important and comprehensive as the common quality, must, of course, force a change in the entire gradation. The old rules said that in firsts the piece must be clear up to 12 inches; in the new, 10 inches is the rule. A like reduction of the width has been effected when standard knots are admitted. In the old style, 13 to 15 inches; new style, 11 to 14 inches. It took 16 to 20 inches in the old style to admit two standard knots; in the new rules 15 inches is the maximum.

Seconds in the old rules were 8 inches and up wide; in the new, 6 and 7 inches are made to answer the purpose. Like reductions in width for the admission of standard knots are noticeable in the newer rules. This shows that wide lumber was growing scarcer and higher of price, which forced an abatement in the severity of the rules anent the admission of defects. The common grade in oak lumber in the later specifications reduces the width of clear lumber, as compared to seconds, with a corresponding gradation of widths in respect to defects.

In further considering the grading and handling of oak in the time prior to 1890, we cannot do better than to quote from a treatise published late in the '80's as follows:

The question as to whether it is advisable for millmen to hold oak until it is well seasoned before offering it for sale, or holding only until in shipping order—that is,

sufficiently dry to reduce the cost of freight to a specified amount—is one of policy rather than necessity. Thoroughly to season oak on sticks is to take a great many chances on the development of imperfections, and many shrewd operators deem it advisable to make contracts which throw the bulk of such chances upon the purchaser, who can lessen the risk by artificial drying.

Cabinet oak, by which is meant lumber prepared for use in the manufacture of interior finish for houses, stores and cars, must, to meet the full requirements of the New York trade, run largely to clear. This class of oak, in lengths of 12 and 14 feet, will, at the average market of 1888, command from $36 to $41 a thousand, in thickness from 1 to 2 inches, widths from 8 to 18 inches. A carload of boards running between these widths, but consisting largely of 8, 10 and 12 inch pieces, would be worth from $36 to $37; if not less than one-half were 12, 14 and 16 inch widths, with a fair sprinkling of 18 and 20 inch boards, the selling price would increase to $38 or $39. Plank of a similar character would sell at $39 to $41. There is a special desire on the part of consumers to secure boards the same average width as plank. This is a feature of manufacture that is too little known, as the average millman saws the largest and best logs into plank, when a wide run of boards would sell more rapidly and command fully as good a price. Cabinet stock also includes thicknesses up to, and including, 4-inch. Such stock is used principally when carving is indulged in. It naturally follows that such stock must be pretty near perfect and sell at the maximum price. In all thicknesses of cabinet oak, the best price can be obtained for 14 and 16 foot lengths. It is also necessary to have thicknesses plump and even the entire length of the piece. There is no sale for ¾-inch oak; such stock is prepared in the South for tobacco boxes, and should never be shipped to New York. All rail shipments are far preferable to rail and water. The less lumber is handled, the more the liability to damage is reduced.

QUARTER-SAWED OAK.

It is not more than ten or twelve years since quarter-sawed oak began to attract special attention in the East as a desirable wood for interior finish. Quartered oak is used in the New York market for a variety of purposes, but there are few outside the range of cabinet work.

The question of grades was settled by the Lumber Trade Association in the following rules, which were much modified in the rules of 1904:

Grades—Firsts and seconds.

Firsts are to be 6 inches and over in width; 6 to 9 inches wide shall be clear; 10 inches and over in width will admit one standard knot, showing only on one side, or equal defect.

Seconds are to be 6 inches and over in width; 6 to 9 inches wide will admit one standard knot, or equal defect; 10 inches and over in width will admit two standard knots, or equal defects.

Strips 4 to 5 inches wide shall be clear or clear one side; wormholes in excess of the defects allowed for knots, and stained or discolored boards not admitted.

The most salable thickness is inch, and in many instances boards are glued together in preference to using plank. The demand for thicknesses above 1 inch probably does not amount to over 30 percent of the total sale.

The standard of widths in the New York market is 6 inches and over, and any pieces below that width are classed as strips and sell at a separate price. A carload of boards, running largely 6 to 10 inches wide, even

though absolutely clear, is not of standard quality. To reach that basis not less than 25 percent must run 12 to 18 inches wide.

Strips, which include widths below 6 inches, are used for flooring, ceiling, wainscoting and piece work generally. The general rule of inspection is that one side must be perfectly clear. A shipper should never load strips in with standard widths.

Standard lengths are 12 to 16 feet; preferences are for 14 and 16 feet, due to the fact that for many uses 12-foot stock will not cut up to advantage. In door work, which includes not only the doors themselves, but the casing, it is especially desirable to have 14 and 16 foot lumber, as shorter cuts to waste. All 12-foot stock invariably sells at a lower price than 14 or 16 foot, or a combination of 12, 14 and 16 foot. An excess of over 40 percent of 12-foot stock in a carload is certain to injure the price, unless the lumber is extra wide. Buyers are always ready to state that nothing under 16 feet long can be used to advantage. This claim is arbitrary and selfish. The shipper who can supply quartered oak in the proportion of 40 percent 12-foot, 35 percent 14-foot and 25 percent 16-foot will have little difficulty in disposing of his stock to advantage so far as lengths are concerned. Comments upon widths and length apply to plank as well as boards.

CAR AND BRIDGE OAK.

Oak manufactured for car and bridge work is of entirely different character from cabinet stock. The latter appeals to the eye in point of superficial beauty; the former must possess the element of strength. Oak for car sills and bridge girders is generally sawed to order, and shipped direct from the saw. Sizes vary to such an extent that it is impracticable to enter into details, and the same may be said of lengths. A schedule may specify stock from 6x6 to 12x12 inches, and 6 to 60 feet in length. Knots, sap and other imperfections that in any way impair strength are debarred from this kind of stock. The bulk of such orders are purchased at f. o. b. prices.

OAK FOR EXPORT.

Specifications for sorting shipping oak are imperative, and the slightest deviation is not permissible. The thicknesses of oak exported run from 1 to 6 inches, with a general request for 3 and 4 inch. The best length is 16 feet, although 12 and 14 feet find sale. The former is always salable, the latter is dependent on the market to which it is shipped. The width must be 10 inches and over. This means that $9\frac{3}{4}$ inches will not be accepted under any circumstances. Export stock must have square edges and ends, parallel widths, even thickness the entire length, and be absolutely free from heart, checks, splits, large or loose knots, wormholes or shakes. Sound knots, if not large, will pass inspection, hence the common impression

that export stock must be absolutely clear is erroneous. The chief aim is to secure sound lumber, of the specified widths, free of splits or checks. It may be added that handlers of export lumber in New York, in no instance, do the exporting themselves; they simply sell to buyers for foreign houses, who rarely purchase stock outside the market. The reason for this course is that when a vessel is waiting for a cargo, there is no time to be lost in ordering stock from a distance, with the usual uncertainty of arrival. A vessel is run alongside the dock of a dealer in export stock, exactly the quantity and quality of lumber desired is placed on board, and the vessel clears on time.

COTTONWOOD.

The Lumber Trade Association rules for inspection of cottonwood in 1889 were as follows:

Grades—Firsts, seconds and culls.

Firsts.—Firsts to be 8 inches and over in width; 8 to 11 inches wide shall be clear; 12 to 15 inches wide will admit one standard knot showing only on one side; 16 to 20 inches will admit two standard knots showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide must be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches will admit two standard knots; 16 to 20 inches will admit three standard knots; live bright sap admitted.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

At that time cottonwood had not taken the place in consumption that it has assumed within recent years. It was then said that there was but one use for cottonwood in New York, and that was in the making of boxes. One or two sellers in that market controlled the trade. The thicknesses then most in demand were 1 and 1¼ inches; the lengths, 12 to 16 feet, and the widths, 8 inches and upward. The selling price for a year had ranged from $21 to $22 a thousand feet, at which price the stock had to inspect 75 percent firsts. The boxes that were made of cottonwood were of the kind that were exposed to excessively hard usage, the bottling works having been large consumers. There was absolutely no use in New York for the lower grades.

Since that time a remarkable change has come into the use of cottonwood lumber, especially in the midcountry, and the scope of grading has been enlarged. At first there was no common grade included in the specifications; more recently such a grade is an important feature in stocks. In this respect cottonwood has repeated the history of all woods: When first introduced nothing but the best will attract the market; later, when the merits of the wood become known, buyers are willing to accept the lower grades.

MAPLE.

Maple was another kind of lumber that was accorded a low rank

and feeble recognition up to 1880. In the early New York rules it was graded firsts, seconds and culls. Late in the '80's of the last century the consumption of maple in New York largely increased, as was true in other parts of the country. Early in that decade there was what was called the roller skating craze, and about every town in the country had its "rink." These rinks were floored with maple, which was peculiarly adapted to the purpose on account of its hardness and smoothness when it was properly dried, milled and treated. The demand for rink floors gave a great impulse to maple production and trade. After the rink craze subsided there was a recession in the demand for maple, but its value had become established, and the trade at length recovered from the collapse and rapidly increased. Maple came into extensive use for factory and warehouse floors, and for other floors where smoothness and wearing qualities were requisites. In New York, late in the '80's, dealers preferred to buy the rough stock and have it dressed to meet the wants of their customers; but that method is now generally discarded, as great flooring factories in Michigan, Wisconsin, Chicago and elsewhere furnish what is wanted at reasonable prices. Besides, they absorb about all the rough stock that is available.

It was said of the New York demand late in the '80's that furniture makers were particular to have their maple a creamy white, which, when sorted out, commanded an extra price. The thickness in the New York market ran from 1 to 6 inches, the thicker than 2 inches having been sold on export orders.

Piano makers used hard maple, cut through and through, and shipped waney edged. The clear stock was used for the action part of the instrument. This trade was a specialty, the buyers sending inspectors to the mills to select the stock. The general uses to which maple was put were much the same as with oak, ash and cherry, and the rules for such lumber were applicable to maple. Maple was, and continues to be, cut in cold, frosty weather, for the reason that it dries out much better thus than when sawed in the warm season.

Following are the rules for the inspection of maple that governed prior to 1890 and probably for several years afterwards:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side; live wide sap allowed.

Seconds.—Seconds are to be 6 inches and over in width; 6 to 7 inches wide shall be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots; live wide sap allowed.

Heart or doted boards and plank will not be admitted in firsts and seconds.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

MAPLE JOISTS—4x4 TO 10x10 INCHES.

Firsts.—Firsts are to be 10 feet and upward in length, clear, sound, and free from all defects, and of full size when seasoned.

Seconds.—Seconds are to be sound and free from hearts, shakes and checks; 10 and 12 foot lengths admit two standard knots; 14 and 16 foot lengths admit three standard knots; bright sap admitted; these defects are based on 6x6 joists, and are to bear the same ratio on other sizes.

Culls.—Culls include all joists not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

As in other cases, squares in that period were called "joists," a designation that in later rules of inspection has been dropped and "squares" substituted. The grades of maple have not been greatly changed in recent years, except that a grade of "common" has been provided for in the later rules.

BIRCH.

The following were the New York inspection rules for birch lumber in former times:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 10 inches wide shall be clear; 11 to 14 inches wide will admit bright sap on one side not exceeding 1 inch in width or one standard knot, showing only on one side; 15 to 20 inches wide will admit bright sap on one side, not exceeding two inches in width, or two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 10 inches wide will admit one standard knot; 11 to 14 inches wide will admit two standard knots; 15 to 20 inches wide will admit three standard knots.

In any widths, not more than one-third of the surface of one side shall be sappy.

The following is a contemporary description of birch conditions in the New York market prior to 1890:

The sale of birch in the New York market is limited, simply because it is a wood that comes into use as a substitute for cherry, and, to fulfill that mission, must be its counterpart in width, length, thickness and quality. The Creator does not seem to have given life to birch timber equal to such an emergency, while the average millman has so far failed to assist nature's handiwork, or to receive practical proof that there was a profit in sawing birch at the prices which New York buyers seemed to think the wood was worth. It seems to be difficult to find birch timber, exceeding 24 inches in diameter, that is perfectly sound, the nature of the tree being to show decay at the heart very soon after it gets beyond 18 inches in diameter. Such being the case, it is next to impossible to manufacture birch lumber that will compare favorably with an ordinary run of cherry. Birch and beech are used largely in the manufacture of chairs, entering into the entire construction of such in a great variety of dimensions. It seems advisable for such purposes to prepare the wood in dimension sizes, thereby obviating the shipment of waste portions and enabling a millman to utilize every portion of the product of a log except such as may be rotten or otherwise absolutely worthless. The variety in demand is the black or cherry birch, and the bulk of inquiry

is for boards, which, to sell readily, must run 12 to 16 feet long, 8 inches and over wide and inspect 65 percent firsts.

Since the above was written birch has to a preponderating extent taken the place of cherry, and more recently has been used as a substitute for mahogany, and within recent years has been an active commodity in the lumber market.

BEECH.

There was in the '80's an extremely small demand for beech in New York. When mixed with birch, and of the same quality and width, it passed; but it was rarely called for to be shipped separately. No great change has since occurred in the market for beech, though of late years it has been more extensively used. The inspection at that time was as follows:

Grades.—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 10 inches wide shall be clear; 11 to 14 inches wide will admit one standard knot, showing only on one side; 15 to 20 inches wide will admit two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 10 inches wide will admit one standard knot; 11 to 14 inches wide will admit two standard knots; 15 to 20 inches wide will admit three standard knots.

Culls.—Culls include all lumber not equal to the grade of seconds, half of each piece being merchantable; other than as above stated shall be classed as mill culls.

The comments in reference to birch and maple are applicable to beech.

CHESTNUT.

The handling of chestnut in the New York market was confined to a comparatively few firms. In one sense it was a specialty; still the consumption was large, and could have been made more profitable if millmen had made a more careful study of the demand and its details. The Lumber Trade Association rules of inspection were as follows:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots; wormholes in excess of the defects allowed for knots, and stained or discolored boards not admitted.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

CHESTNUT JOISTS—4x4 AND OVER SQUARE, 8, 10, 12, 14 AND 16 FEET LONG.

Merchantable.—Merchantable must be straight, sound, free from hearts and shakes; 8 and 10 foot admit two standard knots, 12, 14 and 16 foot admit three standard knots. Must be free from wane except that will admit 1-inch wane on one corner one-fourth the length. Wormholes in excess of defects allowed for knots not admitted. Culls include all joists not equal to the grade of merchantable, one-half of each piece being merchantable. Other than as above stated are not marketable.

BASSWOOD.

Basswood was graded as firsts, seconds and culls, the modern grade of common having been omitted, as in several other of the minor woods. The following grading rules were in force in the '80's:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 12 inches will admit one standard knot; 13 to 15 inches will admit two standard knots; 16 to 20 inches wide will admit three standard knots; live wide sap allowed.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

The following comments were applicable at the time the above rules were recognized as the basis of inspection:

Basswood is used in New York principally for boxes and trunks. Although the grades are firsts, seconds and culls, it is customary to refer to but two grades, known as clear white and common. The former must be exactly what its name implies—clear white. This quality is used in thicknesses of $\frac{5}{8}$, $\frac{3}{4}$ and 1 inch in the construction of piano keys and various parts of the action of pianos. In color it must be a creamy white, and entirely free from the black and brown streaks so common to this wood. The same standard of lengths applicable to other hardwoods is expected in basswood, and exactions on manufacture are equally as rigid. Clear white basswood is used to a certain extent for house finish, especially inside blinds. It has long been in use for the construction of car blinds; sometimes only for the slats.

Common basswood, which is really the grades of seconds and good culls, is used for boxes and trunks. The former use demands sound stock in board thickness, and objection is made to discolored wood, although a moderate amount is accepted, but it is not safe to rely on a buyer's taking any amount of such stock. For trunk work discolored wood is not objectionable, provided the stock is sound, as the wood is covered. There are trunkmakers who buy basswood cut to regular lengths, but such orders are always provided for by contract.

The New York Lumber Trade Association rules for the inspection of sycamore in the '80's were as here noted:

SYCAMORE.

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit bright sap on one side not exceeding 1 inch in width, or one standard knot, showing only on one side; 16 to 20 inches wide will admit bright sap on one side not exceeding 2 inches in width, or two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches will admit two standard knots; 16 to 20 inches will admit three standard knots; in any width not more than one-fifth of the surface of one side shall be sappy.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

The rules of 1904 made no change except to read "16 inches and over wide," instead of "16 to 20 inches wide."

QUARTERED SYCAMORE.

Grades—Firsts and seconds.

Firsts.—Firsts are to be 6 inches and over in width; 6 to 9 inches wide shall be clear; 10 inches and over wide will admit one standard knot, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 to 9 inches wide will admit one standard knot; 10 inches and over will admit two standard knots.

Sap and doted, or discolored, wood not admitted in firsts and seconds.

Culls are not marketable.

Strips 4 and 5 inches wide accepted only by special agreement.

In quartered sycamore the rules adopted in 1904 were somewhat different from the above. The grade of common was added and it was provided that firsts 6 to 8 inches wide should be clear; 9 to 11 inches should admit one standard knot, or one inch of bright sap; and 12 inches and over two standard knots or two inches of bright sap. In seconds they provide that one standard knot should be admitted in widths between 6 and 8 inches; at 9 to 11 inches, two standard knots; 10 to 12 inches and over, three standard knots. Sap and discolored wood were debarred from firsts and seconds. The rule for common is as follows: "Common shall be 6 inches and over wide; at least three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide."

Plain sycamore was used for making tobacco boxes by Lorrillard & Co., whose factory was located in Jersey City. That firm probably used 95 percent of all the sycamore that was sold under New York inspection, and the firm dictated almost entirely about sizes of the stock. Quartered sycamore was not used to any great extent, because it was not known or appreciated. During the '80's it was brought to the attention of architects, who began to specify it for the interior finish of buildings. It was also employed for cabin finish in steamers, and to some extent for the interior finishing of cars.

ELM.

The demand for elm in the New York market was small, and few dealers handled it. Trunkmakers called for slats that were made in several sizes. There was a considerable amount used for wheelbarrows. The inspection rules were as follows:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side; live white sap allowed.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches will admit two standard knots; 16 to 20 inches will admit three standard knots.

Live white sap allowed.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

The rules of 1904 added the grade of common. Grades of firsts and seconds were made a little easier than they were before while the common grade was thus defined: "Common, 5 inches wide shall be clear; 6 inches and over wide shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide."

GUM WOOD.

Gum, years ago, was classed as a much misunderstood wood in New York, as it was in the rest of the country, but even in the '80's the sale of that kind of lumber was on the increase. It was used for precisely the same purposes to which black walnut was applied. The largest user of gum in the vicinity of New York was the White, Potter & Paige Manufacturing Company, of Brooklyn. That concern had perfected a process for the drying of gum that was called a veritable science by admiring onlookers, and it was declared that the wood was as tractable under that process as any other wood. The scheme was to kiln dry the lumber slowly.

The grades were as follows:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit bright sap on one side not exceeding 1 inch in width, or one standard knot, showing only on one side; 16 to 20 inches will admit bright sap on one side not exceeding two inches in width, or two standard knots, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 and 7 inches wide shall be clear; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots; in any width not more than one-fifth the surface of one side shall be sappy.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

The rules of 1904 are substantially the same as those which they superseded except that they were a little more liberal in defects, beginning with the requirement that in firsts widths from 8 to only 11 inches should be clear.

QUARTERED GUM.

Grades—Firsts and seconds.

Firsts.—Firsts are to be 6 inches and over in width; 6 to 9 inches wide shall be clear; 10 inches and over wide will admit one standard knot, showing only on one side.

Seconds.—Seconds are to be 6 inches and over in width; 6 to 9 inches wide will admit one standard knot; 10 inches and over wide will admit two standard knots.

Sap and doted, or discolored, wood not admitted in firsts and seconds.

Culls not marketable.

Strips 4 and 5 inches wide shall be clear or clear on one side.

In quartered gum no changes were made in firsts except that the words limiting a standard knot to one side were eliminated; the grade of common was added, which provides for 6 inches and over in width, to cut 75 percent clear in not over three pieces. Strips were made 3 to 5 inches wide instead of 4 and 5.

BUTTERNUT.

Butternut was used in small quantity in New York at the time to which these observations apply. It was said in 1889 that ten carloads would supply the market for a year. All wide and clear was demanded by the buyer. These were the grades by which butternut was sold:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots; in any widths not more than one-fifth of the surface of one side shall be sappy.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

HICKORY.

Hickory was graded in the New York market in the '80's according to these rules:

Grades—Firsts, seconds and culls.

Firsts.—Firsts are to be 8 inches and over in width; 8 to 12 inches wide shall be clear; 13 to 15 inches wide will admit one standard knot, showing only on one side; 16 to 20 inches wide will admit two standard knots, showing only on one side.

Seconds.—Seconds are to be 8 inches and over in width; 8 to 12 inches wide will admit one standard knot; 13 to 15 inches wide will admit two standard knots; 16 to 20 inches wide will admit three standard knots.

Culls.—Culls include all lumber not equal to the grade of seconds, one-half of each piece being merchantable; other than as above stated shall be classed as mill culls.

Second growth hickory sawed through and through and rough-edged shall be measured inside the wane, and in the center of the piece.

In the rules of 1904 the grade of firsts in hickory remained unchanged except the restriction of standard knots to one side. Seconds were made 6 inches and over wide; 6 and 7 inches to be clear; 8 to 10 inches to admit one standard knot; 11 to 14 inches, two standard knots, and 15 inches and up three standard knots, with bright sap admitted. The grade of common was added, to be 6 inches and over wide. The remainder of the rule reads as follows: "Shall include all lumber not equal to the grade of seconds, three-quarters of each piece to cut clear in not over three pieces. No cutting to be less than 3 feet long by 4 inches wide."

CHAPTER XXIII.

NEW YORK—THE EASTERN FORESTS.

For nearly 150 years the Adirondack forests of northeastern New York have made steady contributions to the timber markets of America and of Europe. During the earlier stages of their development white pine was the wood chiefly produced and most prized. Before the Revolution and until the opening of the Champlain Canal the timber drawn from most of their area went across the border into Canada, though the southern portions, drained by the headwaters of the Hudson River, were early contributors to the timber needs of New York City and other markets reached via the Hudson. Long ago, however, most of the pine was cut away, and for many years these forests have supplied large quantities chiefly of spruce and hemlock lumber, and in lesser quantities white pine of a common and coarse character. They have also produced considerable quantities of hardwoods. As late as 1905 there was removed from the Adirondack forests 738,000,000 feet of sawlogs, pulpwood, etc., as well as large quantities of shingles and lath.

The Adirondack Mountains occupy more than 12,000 square miles in the northeastern part of New York, and include within their limits most of the counties of Franklin, Essex and Hamilton, and portions of St. Lawrence, Lewis, Herkimer and Warren counties. Their general level is not high, ranging from 1,500 to 2,500 feet above the sea, but many ridges, ranges and isolated peaks rise to higher altitudes, reaching their maximum in Mount Marcy, in Essex County, the summit of which is 5,344 feet above the sea. The whole region is rough and of the most ancient geological formation. Within the area of the Adirondacks nearly all the rivers of eastern New York have their sources. It is this last fact which has been the basis of the recent history of the Adirondack region and also of its sister region embraced within the Catskills.

The importance of preserving the headwaters of the Hudson and other streams, together with the advantages that would accrue from maintaining the Adirondacks as a resort for the people, has led to the establishment of the New York Forest Preserve, with its area, June 30, 1905, of 1,347,280 acres in the Adirondacks and 92,708 acres in the Catskills, which areas have since been increased by tax sales and purchases. The Adirondack part of this forest preserve area is largely included within the Adirondack Park, which covers upwards of 3,300,000 acres and includes, also, a large private ownership.

EARLY LAND GRANTS AND PURCHASES.

The history[1] of the forest lands of northern and eastern New York is punctuated by generous grants made in early days by the Colony and the State, by which individuals received tracts of property whose value they themselves did not realize. The greatest of these grants was Macomb's purchase. Alexander Macomb, in partnership with Daniel McCormick and William Constable, in January, 1792, purchased from the State of New York 3,934,899 acres of land for eight pence an acre. This tract occupied most of the territory now included in Franklin, St. Lawrence, Jefferson, Herkimer and Oswego counties. This Macomb was the father of Major General Alexander Macomb, commander of the American forces at the battle of Plattsburg, in the War of 1812, and subsequently commander-in-chief of the United States army. Macomb soon became insolvent and the principal ownership passed to William Constable. This man had been a member of the staff of General La Fayette in the War of the Revolution. He left the name of Constable to a town in Franklin County and to the village of Constable, in Lewis County. Harrietstown, in Franklin County, was named for his daughter and the town of Duane for her husband, James Duane. Hezekiah B. Pierrepont gave the name of Pierrepont to a town in St. Lawrence County.

It appears that the sale of such a great area at so low a price did not fail to create public scandal, even at that early date. Opponents of the State administration accused the land commissioners of being improperly interested in these transfers. April 20, 1792, Dr. Josiah Pomeroy, of Kinderhook, in an affidavit stated that he believed that a company composed of William Smith, Junior, Sir John Johnson and certain Tories living in Canada had been formed under the direction of Lord Dorchester, with the intention of purchasing a large tract of land upon the St. Lawrence for ultimate annexation to Canada, and he charged that Governor Clinton was a party to this arrangement. The Governor had little difficulty in disproving this charge of traitorism, but, nevertheless, it had its effect upon the subsequent election. Colonel Talbot, of Montgomery, offered violent resolutions in the assembly, intended to pave the way for an impeachment, but an official investigation cleared the commissioners and commended the sale. Aaron Burr, attorney-general, was absent at the time of the sale, but in after years was openly charged with official crookedness in the matter.

Modern manipulation of great interests in the acquirement of private wealth fails to overshadow the enterprise of the men who were concerned in the great Macomb purchase. It is said that Constable, whose name

[1] For much of the detail of this chapter and for nearly all of its statistical contents the author is indebted to William F. Fox, Superintendent of State Forests, Albany, New York.

TYPICAL ADIRONDACK FOREST

OF MIXED HARDWOODS, BALSAM FIR AND RED SPRUCE. HART POND AND MOUNT MC INTYRE, FROM MOUNT JO, ESSEX COUNTY, NEW YORK

was not given to the purchase, but who afterward became its chief owner, was the commercial genius back of the transaction. While the purchase was not made until 1792, the scheme is said to have originated as early as 1786. In 1794, two years after the purchase was consummated, the buyers had secured the passage of a law fixing the minimum price of the remaining 2,000,000 acres of State land at six shillings an acre. thus bulling the price of their own land to that figure and increasing its value nearly 1,000 percent. Theoretically, an area which had cost $629,583.84 attained an immediate value of $5,272,764.66. The settlement of the area included in the purchase, however, was interrupted by the stirring events of the period. The surveyors proceeded no farther than Oswego, while at St. Regis the Indians succeeded in driving off the early settlers. Lord Dorchester declared in 1794 that the sword and not a legislative enactment must determine the boundaries of the country. It was proposed during the War of 1812 to make the Adirondacks, instead of the St. Lawrence River, the northern boundary of the State of New York.

Macomb was one of the greatest promoters in history. He was, perhaps, the largest owner in the Totten and Crossfield purchase and one of the authors of that transaction. His financial end came in the crash of the "Million Bank" in which Isaac Whippo, William Duer and Walter Livingston were concerned. In this bank a large number of persons were heavy losers and so angry were they that Macomb's incarceration April 17, 1792, was really the means of saving his life. The failure paralyzed temporarily the negotiations pending with the Holland Land Company, afterwards a heavy purchaser in western New York.

To Dr. Franklin B. Hough and Nathaniel Bartlett Sylvester the historian is indebted for much information concerning other land grants in New York. An idea of the enormous profits enjoyed by these early land speculators may be gathered from a letter written in 1798 by one of them to his agent in London. He confessed that it might be several years before a profit would be realized upon the original investment, but said that the eventual profit was certain to be large. In 1786 he obtained 3,000 acres in Bayard's Patent on the Mohawk for four shillings an acre, and in 1796 sold them at twenty shillings. Concerning the purchase of the 400,000-acre Boylston tract in 1794 at two shillings an acre, he said:

> On my arrival here in 1795, I had it surveyed and explored, when, it appearing that, from the course of the river by which it was bounded, it comprehended double the quantity, or upwards of 800,000 acres, the purchase being so much larger than I had contemplated, I was under the necessity of proceeding immediately to sell a part of the tract. This I found no difficulty in doing, as the land was found to be uncommonly good. Messrs. Nicholas Low and his associates purchased 300,000 acres at eight shillings, or four shillings sixpence, sterling, one-fourth of the money payable down, the balance in five annual installments, with interest, the whole of the land remaining security on

mortgage. In 1796 I had the whole of the remaining 500,000 acres laid out in townships of 25,000 to 30,000 acres, and sold in that and the succeeding year about 100,000 acres from six shillings nine pence to nine shillings sterling, receiving one-fourth the money down and taking mortgage to secure the balance in five annual payments with interest at seven percent as is customary. I interested a Mr. Shaler in one-half of two townships, on condition of his settling on the tract, and selling the lands out in small farms of about 200 acres, he to be charged nine shillings per acre for his part, and to have half the profit on the sales. He, accordingly, went out and had the lands surveyed, made a road from Fort Stanwix into the midst of it and built a sawmill and a grist mill. His accounts last rendered show the disposal of about 10,000 acres for nearly $40,000, of which he has paid me all the money received, being $10,000, and has made an account of expenses for roads, buildings, etc., of about $4,000. He sells alternate lots at $4 the acre, the settlement of which will immediately give an additional value to the intermediate ones, which we mean to reserve.

These lands were the fertile slopes and bottom lands of the Black River Valley. There was a marked prejudice against lands covered with hemlock timber. Benjamin Wright described one township as "cold and hemlocky." This prejudice was a mistake. As soon as the foliage, with its large amount of tannin, was removed from the ground, the land rapidly increased in value.

Brown's tract was a part of the original Macomb purchase. It embraced only 210,000 acres, although the name is often mistakenly applied to the entire Adirondack region, and also confounded with John Brown, the liberator, who lived in New York State for a time. November 25, 1794, Samuel Ward and wife conveyed this tract to James Greenleaf, who in the following year mortgaged it to Philip Livingston. The mortgage was foreclosed in December, 1798, the land being bid in for $33,000 by Col. John Brown, a Providence, Rhode Island, merchant, one of the founders and for many years the treasurer of Brown University. Nathaniel Bartlett Sylvester says of Brown in his historical sketches of northern New York:

"In 1799 he visited his tract, remaining there during the great part of the summer. He caused it to be surveyed and divided into townships. At a great expense he built three roads into the tract, one leading from Remsen, another from Boonville, and another from High Falls. He made a clearing on Township No. 7, built a grist mill, a sawmill, and several log houses. In that year, also, his agent, James Sheldon, moved with his family onto the tract. For two or three years thereafter John Brown made toilsome journeys to his forest possessions, but he died in 1803, leaving his lands a wilderness."

There were numerous other settlers and speculators who endeavored to force the settlement of Brown's tract, but in each case they were halted by the mighty forest and compelled to await the western march of civilization. The Nobleboro patent contained 40,960 acres and was located in

the present Herkimer County, in the southwestern part of the Adirondack wilderness. In 1787 the Legislature of New York passed the following act:

An Act for the relief of Arthur Noble, and others.

Whereas it is represented to the Legislature, that Arthur Noble hath been at great expense, in order to obtain lands in this State, for the settlement of one hundred families; but by unavoidable accidents, hath been hitherto frustrated in his intentions. And whereas the introduction and actual settlement of a number of industrious families on the frontiers of this State, would be for the general advantage thereof.

Be it enacted, That it shall and may be lawful for the commissioners of the Land Office, to grant to the said Arthur Noble, a quantity of land equal to one township of ten miles, or two townships of eight miles square, of the waste and unappropriated lands in any part of this State, on such terms and conditions, as to them shall appear most conducive to the interests thereof, on his, the said Arthur Noble's paying into the treasury of this State, at and after the rate of one shilling per acre, in certificates made receivable by law in the treasury on the sale of unappropriated land.

Upon the passage of the law, Noble entered into immediate possession, and made some improvements as early as 1790. Among other enterprises he erected a sawmill, "and had some boards sawed out, which he took to Ireland." Noble's schemes, like those of many other speculators, resulted in failure. Noble had also purchased the Arthurboro Patent, containing 47,360 acres. The first settlement was not begun until 1833, when Andrew K. Morehouse bought some land, built a sawmill, a store and a dwelling house and located there with his family. The village of Morehouseville still exists. Necessarily, this is merely a résumé of the history of some of the more important facts. The following gives in detail the early grants made within the limits of the present State of New York:

LIST OF THE PRINCIPAL TRACTS, PATENTS AND LAND GRANTS IN NORTHERN NEW YORK GRANTED BY THE COLONIAL GOVERNMENT.

Name of Patent.	County.	Year.	Acres.	Patentee.
Amherst Tract	Hamilton	1774	20,000	Sir Jeffrey Amherst.
Argyle Patent	Washington	1764	47,450	Duncan Reid.
Artillery Patent	Washington	1764	24,000	Joseph Walton.
Bayard's Patent	Oneida	1771	50,000	W. & R. Bayard.
Beekmantown Patent	Clinton	1769	30,000	Wm. H. Beekman.
Bradshaw's Patent	Washington	1762	23,000	James Bradshaw.
Cambridge Patent	Washington	1761	31,500	Colden, Baynar & Co.
Cosby's Manor	Oneida	1734	22,000	Joseph Worrell.
Coxe's Patent	Oneida	1770	76,000	Daniel Coxe.
Dartmouth Patent	Warren	1774	47,000	Jere. Van Rensselaer.
Dean's Patent	Clinton	1769	30,000	Elkanah Dean.
Glen's Purchase	Saratoga	1770	45,000	John Glen, Junior.
Greenwich Patent	Washington	1763	10,000	Donald Campbell.
Hasenclever Patent	Herkimer	1769	18,000	Peter Hasenclever.
Holland Patent	Oneida	1769	20,000	Lord Henry Holland.
Hyde Township	Warren	1774	40,000	Hyde & Jessup.
Jerseyfield Patent	Herkimer	1770	94,000	Henry Glen.
Jessup's Purchase	Warren	1768	13,650	Ebenezer Jessup.
Kayaderosseras Patent	Saratoga	1708	.....	Nanning Heermanse.
Kempe's Patent	Washington	1764	10,200	John Kempe.
Kingsboro Patent	Fulton	1753	20,000	Arent Stevens.
Kingsbury Patent	Washington	1762	26,000	James Bradshaw.
Livingston Patent	Montgomery	1762	20,000	Philip Livingston.
Lott's Patent	Fulton	1761	20,000	Abraham Lott, Junior.
Lyne's Patent	Herkimer	1754	20,000	John Lyne.
Magin's Patent	Fulton	1761	6,000	Sarah Magin.
Mayfield Patent	Fulton	1770	.....	.....

Ord's Patent	Essex	1775	5,000	Thomas Ord.
Preston Patent	Hamilton	1770	14,000	Achilles Preston.
Queensbury Patent	Warren	1762	23,000	Daniel Prindle.
Royal Grant	Herkimer	1765	93,000	Sir Wm. Johnson.
Sacandaga Patent	Fulton	1741	28,000	Lendert Gansevoort
Salem Patent	Washington	1764	25,000	Alex & Jas. Turner.
Schuyler Patent	Herkimer	1755	43,000	David Schuyler.
Skenesboro Patent	Washington	1765	25,000	Philip Skene.
Stewart's Patent	Hamilton	1755	24,000	James Stewart.
Stone Arabia Patent	Fulton	1723	12,700	John C. Garlock.
Totten & Crossfield	Hamilton	1772	1,150,000	Jos. Totten and others.
Van Rensselaer Patent	Saratoga	1774	28,964	Jere. Van Rensselaer.
Walton's Patent	Herkimer	1768	12,000	William Walton.

LIST OF THE PRINCIPAL TRACTS, PATENTS AND LAND GRANTS IN NORTHERN NEW YORK GRANTED BY THE STATE.

Name of Tract.	County.	Year.	Acres.	Patentee.
Adgate's Patent	Herkimer	1798	43,907	Matthew Adgate.
Arthurboro Patent	Herkimer	1787	47,360	Arthur Noble.
Bailey's Patent	Essex	1806	8,000	John Bailey.
Benson Township	Hamilton	1795	61,920	Egbert Benson
Bergen's Purchase	Hamilton	1785	19,589	John Bergen.
Brant Lake Tract	Warren	1803	38,496	254 lots sold to various persons.
Chase's Patent	Fulton	1792	12,000	William Chase.
Dominick's Patent	Essex	1789	12,600	Francis Dominick.
Duerville Patent	Clinton	1789	39,692	William Duer et al.
French Mountain Tract	Warren	1810	5,918	Sixty-two lots sold to various persons
Glen, Bleecker & Lansing	Fulton	1794	89,297	Cornelius Glen et al.
Hague Tract	Warren	1817	10,212	Sixty-two lots sold various ones.
Hoffman Patent	Essex	1795	25,200	Anthony Hoffman's heirs.
Iron Ore Tract	Essex	1810	34,380	234 lots sold various ones.
Jay Tract	Essex	1814	33,534	160 lots sold various ones.
Lawrence Patent	Hamilton	1791	35,560	Jonathan Lawrence.
Luzerne Tract	Warren	1810	23,826	173 lots sold various ones.
Macomb's Purchase	St. Lawrence	1792	3,934,899	Alexander Macomb
Maule's Patent	Essex	1800	42,969	Thomas Maule.
Moose River Tract	Herkimer	1820	222,630	Ten townships.
North River Head Tract	Essex	1807	19,500	140 lots sold various ones.
Old Military Tract	Clinton	1785	665,000	Twelve townships sold various ones.
Oxbow Tract	Hamilton	1811	64,671	296 lots sold various ones.
Nobleboro Patent	Herkimer	1787	40,960	Arthur Noble.
Palmer's Purchase	Warren	1788	135,000	Thomas Palmer.
Paradox Tract	Essex	1807	70,000	428 lots sold various ones.
Peru Bay Tract	Essex	1811	23,179	130 lots sold various ones.
Refugee Tract	Clinton	1788	231,540	416 lots sold various ones.
Remsenburgh Patent	Herkimer	1787	48,000	Henry Remsen.
Road Patent	Essex	1794	9,867	Platt Rogers.
Roaring Brook Tract	Essex	1817	21,274	Eighty-six lots sold various ones.
Schroon Tract	Essex	1803	17,811	111 lots sold various ones.
Tongue Mountain Tract	Warren	1815	11,913	Fifty-two lots sold various ones.
Warrensburgh Tract	Warren	1816	3,971	Twenty-two lots sold various ones.
West of Road Patent	Essex	1810	28,000	205 lots sold various ones.
White Face Mt. Tract	Essex	1814	10,042	Six lots to various ones.
Woodhull Tract	Herkimer	....	40,000	Fifty-two lots to various ones.
Vrooman's Patent	Herkimer	1786	14,193	Isaac Vrooman.

The history of the forest legislation in the State of New York may be said to date from the Act of Attainder passed in 1779 "for the forfeiture and sale of the estates of persons who had adhered to the enemies of the State, and for declaring the sovereignty of the people of the State in respect to all property within the same." Included in the list of persons named in this act were the principal owners of the Totten & Crossfield purchase and other patents. Most of the early legislation was colored by war. The old Military Tract was created by an act of 1781, providing for the raising of two regiments for the defense of the State on the boundaries of unappropriated lands. A similar act was passed in 1782, and in 1784 there was further legislation to carry out the purposes of the two acts just named.

In 1784 the State turned itself to legislation of more peaceful inspira-

tion. In that year an act was passed to encourage the settlement of the waste and unappropriated lands of the State by making grants to parties of forty-two or more persons who expressed intentions of making actual settlements. Because of the possibility of delays in execution, this act was repealed in 1785 and a new act adopted, making more rapid settlement possible. In 1786 the Legislature of the State confessed in an act "for the speedy settlement of the unappropriated lands within the State," that "experience had evinced that the settlement of the unappropriated lands of the State in the manner directed by former acts was subject to great embarrassment and inconvenience and productive of controversy." The method of disposing of these lands was made more expeditious by a new enactment.

In 1797 the celebrated, but somewhat ineffective, Refugee Act, an act for the relief of Canadian and Nova Scotian refugees, was passed. The refugee tract contained 231,540 acres and was situated in Clinton County, bordering on Lake Champlain. It was the result of sympathy and assistance afforded the American revolutionists in their invasion of Canada by subjects of King George, who were citizens of Canada and Nova Scotia. It had been fondly hoped that this invasion would add the territory to the United States, but the invasion was a failure; the colonial troops were compelled to retire and those English subjects who had espoused the American cause were compelled to leave the land of the King. To provide a home for these sympathizers, the refugee tract was created, but only fifteen lots were taken and the rest of the lands reverted to the State.

The erection of sawmills in the counties of Franklin and Essex was encouraged by an act of 1822, which read as follows:

> Be it enacted by the People of the State of New York, represented in Senate and Assembly, That it shall be lawful for the commissioners of the Land Office to grant, in the manner and subject to the conditions and restrictions hereinafter imposed one lot in township number ten, of the old military tract, lying in the county of Franklin, to each and every person who shall, within five years from the passing of this act, have cleared and fenced fifteen acres of such lot, and thereon erected a habitable dwelling, and there settled with a family; and also three lots to each and every person who shall have, within four years after the passing of this act, built and put into operation, one good and sufficient grist mill, within the said township, and one lot to each and every person who shall, within two years after the passing of this act, have built and put into operation, one good and sufficient sawmill, within the said township; Provided, That the whole number of persons so receiving grants of lots shall not exceed thirty.

FOREST PRESERVATION AND LOGGING LAWS.

In 1883 an act was passed prohibiting the sale of lands belonging to the State in the counties of Clinton, Essex, Herkimer, Franklin, Fulton, Lewis, Saratoga, St. Lawrence and Warren, which included valuable forest areas. There was early legislation dealing directly with the regula-

tion of the forests. In 1788 an act was passed to prevent the firing of the woods, and providing a fine of £10 for setting a fire which spread to the property of another person, and a daily fine of four shillings for refusing to assist in extinguishing a forest fire. In 1817 this act was amended so as to change the penalty from £10 to $100. In 1876 the penalty was increased to $1,000, or imprisonment for one year, and for refusing to assist in extinguishing a fire $100, or imprisonment for sixty days.

The first legislation actually inspired by lumbermen and intended for their relief was an act passed in 1804 "to prevent the stopping and embezzling of timber floating on the Hudson River." This act provided that any person who stopped the raft of another on the river, or caused it to lodge on the shore, without the consent of the owner, should pay a forfeiture of $10. Putting a false mark on timber was punishable by a fine of $25 and damages. However, if the raft owner permitted a raft to remain longer than three months on private property after due notice, the owner of the land might take the timber to his own use. A similar act governing the Ausable River was passed in 1825.

The regulation of the rafting of lumber, logs and other timber upon the rivers of the State was always a weighty question to the legislature. It had in 1813 made the use of log marks on the Hudson River compulsory. In 1880 there was enacted "an act to regulate the passage of lumber, logs and other timber upon rivers of the State recognized by law or common use as public highways, for the purpose of floating and running lumber, logs and other timber over or upon the same to market or place of manufacture." This act was amended in 1881 and 1891. The original act sought to regulate the building of dams in the rivers of the State and provided that no dam should be erected that did not provide an apron of at least fifteen feet in width, to permit the passage of logs, and no bridge was to be erected which would interrupt such rafts or drives. The act contained other conditions, all of them favorable to the lumbermen; but it was provided that it should not apply to the Hudson River. This single exception was fruitful of others; for the amendment of 1881 also exempted the Allegheny, Delaware, Moose, Beaver, Oswegatchie, Grass and Raquette rivers and other tributaries and the waters of Franklin and Lewis counties. In 1891 an amendment added to this formidable list West Canada Creek and its tributaries and the Black River and its tributaries.

An act of 1808 made possible grants of forest land as a source of fuel for the manufacture of iron. Subsequent acts of 1847, 1867 and 1889 withdrew from sale forest lands within twenty miles of the prison, in order that wood might be used in the manufacture of iron by the convicts.

In 1826 the first act for the punishment of persons cutting timber on State lands was passed. The penalty was placed at $25 a tree.

In 1783 the Legislature passed an act to enable persons whose buildings had been destroyed by the enemy in the War of the Revolution to secure timber from the public lands for the purpose of rebuilding.

There has been considerable legislation for creating corporate bodies which sought to maintain and provide parks, or had other purposes in view. One of the most remarkable of these was the American Forest Tree Appropriation & Land Company, which was created by an act of 1865. The object of this concern was the acquiring of lands in states and territories and the propagation and growth of forests and other trees and plants of all sorts.

An act of 1813 provided a penalty for floating a tree so as to obstruct a public highway or stream. In 1855 a law was enacted providing punishment for the cutting of the trees of another or malicious destruction of any tree. The planting of shade trees along the highways was encouraged by acts of 1863, 1869 and 1875. It was provided that any inhabitant liable to highway tax who might transplant by the side of a public highway any forest shade trees or fruit trees should be allowed $1 abatement of his highway tax for every four trees thus set out. The Friday following the first day of May in each year was made Arbor Day by an act of 1888.

At various times laws have been enacted declaring certain drivable streams public highways. The Salmon River, in Clinton County, was thus designated by an act of 1806, which was amended and reaffirmed in 1864. The same act in its original form prevented the obstruction of the Schroon River in Washington and Essex counties. In 1855 an appropriation of $5,000 was made for the improvement of the Salmon River and an additional $5,000 in 1857. Parts of the Raquette (locally known as the "Racket") and St. Regis rivers in St. Lawrence County were made public highways in 1810, and the improvement of the Raquette was attempted by an appropriation in 1850. Additional legislation regulating the floating of lumber on the Raquette was adopted in 1850 and 1851. The original appropriation was one of $10,000 in 1854 and there were other appropriations indirectly applied on this work. In fact, there were no fewer than fifteen acts having to do with this river. The Oswegatchie River was declared a public highway in 1816 and again in 1854, and in an enlarged sense in 1878. The improvement of this river was contemplated in an act of 1865. The Schroon River was made a public highway in 1819. This act was amended in 1830 and 1852. Certain of its tributaries received attention from the legislature in other years. The Black River was made a public highway in 1821; the Grass River in 1824. Five thousand dollars was appropriated for its improvement thirty years later. In 1857 $3,000 was appropriated for the further improvement of the Grass River. Another

$20,000 was appropriated in 1872 and there was an appropriation of $6,000 in 1886. The Grass River was the subject of nine separate acts of legislation. The Saranac River was not made a public highway until 1846 and its improvement was attempted in 1851. The statute books reveal other acts in 1853, 1854, 1871, 1882 and 1890. The improvement of the upper waters of the Hudson River was the purpose of an appropriation of $10,000 made in 1849. The Moose River was made a public highway in 1851 and a company for its improvement incorporated in 1872. The Chateaugay River was made a public highway in 1851, the Beaver River in 1853. The improvement of the Ausable River was attempted during this same period. Appropriations for the Beaver River were made in 1864 and 1866. West Canada Creek was made a public highway in 1864. The West Branch of the St. Regis was made a highway in 1854 and the East Branch in 1860, with important amendments in 1866 and 1869. Improvements of the East and West branches were begun in 1871 and a law of 1889 sought to prevent the obstruction of the East Branch with sawmill refuse. Although the Sacandaga River was improved in 1854, it was not made a public highway until 1869 and this act was amended in 1882 and 1883. The East Branch of the Chazy River was made a public highway in 1857 and the act amended in 1866. Its improvement was begun in 1868. The regulation of rafting and driving was attempted in an act of 1869. There were other considerable appropriations in 1870 and 1871. Deer River was made a public highway in 1867. In 1872 Indian River was made a public highway with some amendments in 1885. Numerous other streams of New York, of minor importance, have been the subject of State legislation.

THE NEW YORK FOREST PRESERVES.

First among all the states of the Union that care for those interests of their citizens which depend upon the preservation of their forests is New York. The Adirondack and Catskill mountains are the pleasure sections of the State. They are the resort of those who, within its boundaries, seek rest and recreation. From the Catskills, being comparatively limited in area and settled and developed at a more early date, game animals have long ago disappeared; but the Adirondacks are still, to a considerable extent, a wilderness, where the wild game native to the section still are to be found and where by preservation, under the guardianship of game laws, the fauna is increasing year by year. Both are sections of hills and mountains, lakes and brooks, and the attraction of each depends largely upon the forests which originally densely covered them.

As we have seen they have been for generations the scene of lumbering operations, and forty years ago encroachments upon these forests had been so extensive that their popularity and usefulness as recreation grounds

were threatened. Logging operations and fire combined to make desolate these beautiful sections, and, further, laying bare the mountain sides, not only tended to render the regions unattractive, but seriously to affect the waterflow. The headwaters of the Hudson River and the northern tributaries of the Mohawk lie almost entirely within the Adirondacks, among them being such famous streams as the Schroon, Indian and Sacandaga rivers and the Canada creeks. Even more important and famous are some streams entering into Lake Ontario, the Hudson and Lake Champlain, such as the Ausable, the Saranac, the Chateaugay, the Salmon, the St. Regis, the Raquette, the Oswegatchie and the Black rivers. Increasing denudation disturbed their dependability as sources of water power, floods at some seasons being succeeded by low water at others.

The situation began to attract attention soon after the Civil War and resulted, in 1872, in a law which named seven citizens as a State Park Commission. It was headed by Hon. Horatio Seymour. This commission was instructed to make inquiries with a view to reserving or appropriating the wild lands lying northward of the Mohawk, or as much thereof as they might consider advisable, for a State park. The commission found that there was but 40,000 acres in that region under State ownership and that the holders of the rest of the land were disposed to combine and force an enhancement of values should the State want to buy. On the strength of this condition the commission recommended that a law be passed forbidding further sales of State lands and that when forfeited for the nonpayment of taxes title be retained by the State. But it was not until eleven years later, in 1883, that this recommendation was acted upon, when the State, through the nonpayment of taxes by the owners, had become possessed of 600,000 acres.

THE ACT OF 1895.

The following year the comptroller was authorized to employ "such experts as he may deem necessary to investigate and report a system of forest preservation." The report of these experts was made in 1885, but the legislation it proposed aroused much opposition from the lumbering interests. The legislature finally, by act of May 15, 1885, passed a compromise bill entitled, "An act establishing a forest commission, and to define its powers, and for the preservation of forests." This legislation, however, was afterwards amended, and the original forest commission, appointed under this act, was superseded by the Forest, Fish and Game Commission, under the law of April 25, 1895.

The law of 1895 described the forest preserve and defined the powers and duties of the commission, which should have the care, custody and control of the forest preserve; maintain, protect and promote the growth

of its forests; have charge of the public interests of the State in regard to forestry and tree planting, and was given special authority looking toward the prevention of forest fires in every part of the State. It was to prescribe rules and regulations necessary for the use and administration of the preserve, but it could not prevent the free use of any road or stream as it had been previously used or might be reasonably required in the prosecution of any lawful business. It was authorized to take measures for the promotion of forest sentiment and for the imparting of elementary instruction regarding forestry in the schools of the State.

Another section provided that all incomes from the State lands should be paid into the State treasury and constitute a fund for the purchase of lands within the Adirondack Park. Another section provided for the taxation of the forest preserve, all wild or forest land to be assessed and taxed at a valuation and rate proportionate to similar lands belonging to individuals within the same counties. Payment of taxes on State lands were to be made by the State treasurer, crediting the county treasurer with the amount of said taxes due on such lands payable on the State tax of the year.

Other sections provided for protection against fire, with penalties for violation of the rules on this subject. Another gave the board the same rights to bring suits for trespass on the lands of the forest preserve as citizens had regarding trespass on private lands, and made the cutting of trees or removal of any timber or bark from any portion of the preserve a misdemeanor punishable by a fine of $25 for every tree so cut or removed.

Article XIII referred to the Adirondack Park, defining its limits, and in one section said: "Such park shall be forever reserved, maintained and cared for as ground open to the free use of all the people for their health and pleasure, and as forest lands, necessary for the preservation of the headwaters of the chief rivers of the State, and a future timber supply; and shall remain part of the forest preserve." The Forest, Fish and Game Commission, in whose custody the park was placed, was authorized to contract for the purchase of lands within the limits of the park and to contract with the owners of land situated within the park limits that such lands may become part of the park subject to the provision of the act in consideration of the exemption of such lands from taxation for State and county purposes, providing their owners or grantors should refrain forever from removing any timber except spruce, tamarack, or poplar twelve inches in diameter and three feet above the ground, or fallen, burned or blighted timber, and obey such other conditions of occupancy as may be equitable. Owners might also clear land for agricultural or domestic purposes at the rate of not more than one acre within the boundary of each 100 acres covered by such contract. The board was also authorized to prescribe

and enforce rules for the licensing or regulation of guides and other persons engaged in business in the park, and to lay out roads and paths in the park.

It will be noted that the above summary of the law of 1895 draws a distinction between the "Adirondack Park" and the forest preserve, which are by no means identical, only part of the area of the park belonging to the State, though restrictions were placed upon the cutting of timber under private ownership, while a considerable area of the forest preserve is outside of the park proper.

FOREST PRESERVES AREA AND TITLES.

The report of the Forest, Fish and Game Commission for 1905, the portion of which relating to the forest preserve was prepared by the Hon. William F. Fox, superintendent of State forests, went somewhat extensively into the subject of ownership. A definition of the forest preserve is found in Sections 2 to 16, page 20, laws of 1900, as follows: "The forest preserve shall include the lands under, or hereafter acquired by the State within the county of Clinton, except the towns of Altona and Dannemora, and the counties of Delaware, Essex, Franklin, Fulton, Hamilton, Herkimer, Lewis, Oneida, Saratoga, St. Lawrence, Warren, Washington, Greene, Ulster and Sullivan, except lands within the limits of any village or city and lands not wild lands acquired by the State on foreclosure of mortgages made to loan commissioners."

At the time of the report the total acreage owned by the State was 1,439,988 acres, of which 1,347,280 was in the Adirondack counties and 92,708 in the Catskill counties. In the Adirondack counties, 1,228,357 acres was inside the Adirondack Park and 118,923 acres outside the park. In the Catskill counties 82,652 acres was within the Catskill Park and 10,056 outside the park. It will be seen that the forest preserve acreage within the Adirondack Park was but a minority of the park acreage, the latter being, as stated before, more than 3,300,000 acres, that not belonging to the State being largely private preserves, owned by individuals or associations. At the time of the above report 768,509 acres had been acquired through tax sales, most of them by the sales of 1871 and 1877. These lands were for the most part covered with a virgin forest in which no lumbering had been done, but the greater part of the lands acquired by later tax sales had been lumbered, though for the most part not closely. In addition to the lands secured through tax sales 151,451 acres were purchased prior to 1897 and 499,597 acres after that date. Mortgage foreclosures accounted for 10,459.5 acres, and resales of bonded land for 9,971 acres. It will be seen, therefore, that of the total area of the forest preserve in 1905 more than one-half had come through tax sales.

There is a suggestion in this to other once timbered states which have land more suitable for timber growing than for any other purpose. Most

of such states, by retaining land coming into their possession by default in taxes, may in course of time acquire a large part of the lands suitable for forest preserve uses.

The figures by counties,[2] relating to the area of the Adirondack and Catskill preserves, together with the methods by which they were acquired, are as follows:

ADIRONDACK PRESERVE.

Counties.	Number of parcels.	Acquired at tax sales.	Acquired by purchase.	Mortgage fore-closures.	Resale of bonded land.	Total acres.
Clinton	110	15,962.18	3,979.93	123.75	363.14	20,429
Essex	1,208	189,684.06	50,919.44	819.50	2,105.00	243,528
Franklin	419	93,995.47	67,157.53	139.00	1,060.00	162,352
Fulton	182	22,710.00	.....	455.00	105.00	23,270
Hamilton	2,308	255,801.66	317,709.53	68.81	2,520.00	576,100
Herkimer	535	20,891.59	123,512.39	728.02	.....	145,132
Lewis	49	4,412.25	.....	107.75	.....	4,520
Oneida	82	2,430.19	.....	3,616.35	646.46	6,693
St. Lawrence	102	33,619.44	.....	616.56	.....	34,236
Saratoga	92	10,402.65	.....	1,242.35	.....	11,645
Warren	596	66,219.16	49,224.34	.....	1,739.50	117,183
Washington	20	1,081.00	.....	48.00	1,063.00	2,192
	5,703	717,209.65	612,503.16	7,965.09	9,602.10	1,347,280

CATSKILL PRESERVE.

Counties.	Number of parcels.	Acquired at tax sales.	Acquired by purchase.	Mortgage fore-closures.	Resale of bonded land.	Total acres.
Delaware	95	12,416.00	.....	415.00	.....	12,831
Greene	50	1,059.54	4,418.89	262.07	311.50	6,052
Sullivan	14	825.25	4.75	.....	.....	830
Ulster	400	36,999.10	34,121.23	1,817.30	57.37	72.995
	559	51,299.89	38,544.87	2,494.37	368.87	92,708

In addition to the forest preserves proper, are small areas lying along the St. Lawrence River and on islands therein, making up the St. Lawrence Reservation or International Park. These lands were purchased by the State in 1897 and 1898 through an especial appropriation for that purpose under authority of an act passed in 1896. This act provided that "all that part of the river St. Lawrence lying and being within the State, with the islands therein, and such along the shore thereof as are now owned or shall be hereafter acquired by the State, shall constitute an international park to be known as the St. Lawrence Reservation." This reservation is under the care and control of the Forest, Fish and Game Commission, but is not included within the forest preserve acreage.

THE LAW OF 1897.

We have given above the origin of the New York forest preserves, together with a statement of what has been accomplished in the setting

[2] From the Eleventh Annual Report, Forest, Fish and Game Commission; Albany, 1906.

aside of forest areas. The organization of the preserves, and much of the work of establishing them, has been done under an act approved April 8, 1897, which is so important, both in its local effect and in its influence upon forest legislation in other states, that it should be given special attention. Section 1 of this act provides for the appointment by the Governor from the commissioners of fisheries, game and forests and the commissioners of the land office of three persons to constitute a board to be known as the Forest Preserve Board. The members of this board were to serve without pay, except that they should be reimbursed for actual and necessary expenses, and were given authority to employ such clerical and other assistance as should be necessary.

Sections 2 and 3 regarding the duties of the Forest Preserve Board were as follows:

SEC. 2. It shall be the duty of the Forest Preserve Board, and it is hereby authorized, to acquire for the State, by purchase or otherwise, land, structures, or waters, or such portion thereof in the territory embraced in the Adirondack Park, as defined and limited by the fisheries, game and forest law, as it may deem advisable for the interests of the State.

SEC. 3. The Forest Preserve Board may enter on and take possession of any land, structures, and waters in the territory embraced in the Adirondack Park, the appropriation of which in its judgment shall be necessary for the purposes specified in Section 290 of the fisheries, game and forest law, and in Section 7 of Article 7 of the Constitution.

Section 4 provided for procuring descriptions of lands and methods of transferring of titles.

Section 5 related to claims and agreements between owners of land appropriated and the board, and Section 6, to the methods of determining title and the payment for lands.

In order to protect, so far as consistent with the preservation of the forests and the protection of the watersheds, as well as to preserve the scenic beauties of the forest preserve lands, the following sections of the act relate to the right of the owners of lands to be appropriated to reserve the timber thereon under certain restrictions. Sections 7, 8 and 9 are as follows:

SEC. 7. The owner of land to be taken under this act may, at his option, within the limitations hereinafter prescribed, reserve the spruce timber thereon ten inches or more in diameter at a height of three feet above the ground. Such option must be exercised within six months after the service upon him of a notice of the appropriation of such land by the Forest Preserve Board, by serving upon such board a written notice that he elects to reserve the spruce timber thereon. If such a notice be not served by the owner within the time above specified, he shall be deemed to have waived his right to such reservation, and such timber shall thereupon become and be the property of the State. In case land is acquired by purchase, the spruce timber and no other may be reserved by agreement between the board and the owner, subject to all the provisions of this act in relation to timber reserved after an appropriation of land by the Forest Preserve Board. The presentation of a claim to the court of claims before the service

of a notice of reservation shall be deemed a waiver of the right to such reservation.

SEC. 8. The reservation of timber and the manner of exercising and consummating such right are subject to the following restrictions, limitations and conditions:

1. The reservation does not include or affect timber within twenty rods of a lake, pond, or river, and such timber can not be reserved. Roads may be cut or built across or through such reserved space of twenty rods, under the supervision of the Forest Preserve Board, for the purpose of removing spruce timber from adjoining land, and the reservation of spruce timber within such space shall be deemed a reservation by the owner, his assignee, or representative, of the right to cut other timber necessary in constructing such road, but such reservation does not confer a right to remove such other timber so cut, or to use it otherwise than in constructing a road.

2. The timber reserved must be removed from the land within fifteen years after the service of notice of reservation, or the making of an agreement subject to regulations to be prescribed by the Forest Preserve Board; but such land shall not be cut over more than once, and the said board may prescribe regulations for the purpose of enforcing this limitation. All timber reserved and not removed from the land within such time shall thereupon become the property of the State, and all the title or claim thereto by the original owner, his assigns or representatives, shall thereupon be deemed abandoned.

SEC. 9. A person who reserves timber as herein provided is not entitled to any compensation for the value of the land purchased or taken and appropriated by the State, nor for any damages caused thereby, until:

1. The timber so reserved is all removed and the object of the reservation fully consummated; or

2. The time limited for the removal of such timber has fully elapsed, or the right to remove any more timber is waived by a written instrument filed with the Forest Preserve Board; and

3. The Forest Preserve Board is satisfied that no trespass on State lands has been committed by such owner or his assigns or representatives; that no timber or other property of the State not so reserved has been taken, removed, destroyed, or injured by him or them, and that a cause of action in behalf of the State does not exist against him or them for any alleged trespass or other injury to the property or interests of the State; and

4. That the owner, his assignee, or other representative has fully complied with all rules, regulations, and requirements of the Forest Preserve Board concerning the use of streams or other property of the State for the purpose of removing such timber.

The succeeding portion of the act, sections 10 to 26, both inclusive, is largely devoted to legal procedures, etc., and some sections relate to matters of interest. Section 13, relating to the use of water, is as follows:

SEC. 13. Persons entitled to cut and remove timber under this act may use streams or other waters belonging to the State within the forest preserve for the purpose of removing such timber, under such regulations and conditions as may be prescribed or imposed by the Forest Preserve Board. The persons using such waters shall be liable for all damages caused by such use.

Section 20 relates to trespassing. It is as follows:

SEC. 20. If a person cuts down or carries off any wood, bark, underwood, trees, or timber, or any part thereof, or girdles or otherwise despoils a tree in the forest preserve, without the permission of the Forest Preserve Board, an action may be maintained against him by the board in its name of office and in such an action the board may recover treble damages if demanded in the complaint. Every such person also forfeits to the State the sum of $25 for every tree cut down or carried away by him or under his direction, to be recovered in a like action by the Forest Preserve Board. All sums recovered in any such action shall be paid by the board to the State treasurer and credited to the general fund.

It is under this act that large areas of land have been purchased and under which the Forest Preserve Board has conducted the affairs under its jurisdiction. The result of this and subsequent important legislation has been wholly beneficial. The lumber product of eastern New York has been maintained at a point advantageous to the community at large, materially adding to the lumber and timber resources, while at the same time the streams have been protected, the forest cover has remained adequate and the tourist or summer resident has, by the retention of timber along and around rivers and lakes, not been offended by an apparent denudation and by the debris of lumbering operations.

FOREST FIRES OF 1903.

Furthermore, forest fires have largely been prevented. Even in the disastrous year of 1903, when, in spite of all that care and the expenditure of labor and money could do, the losses were heavy, the fire protection afforded by the Forest Preserve Board undoubtedly prevented the complete wiping out of the Adirondack and Catskill forests. Enormous damage was done, but seldom did one fire area connect with another, and for the most part they were confined within comparatively narrow limits and did not, as in Maine, sweep over great sections. In his report on the forest fires of 1903, William F. Fox, superintendent of State forests, said:

No rain, except slight local showers, fell in the Adirondack region from April 4 to June 11. The month of May was the driest in seventy-seven years—since 1826. In Albany the rainfall was only fifteen one hundredths of an inch, and it was still less in northern New York. Combined with the lack of rain there was an unusually high temperature, the month of May showing an accumulated excess above the normal of 89 degrees On May 6 and 19 the temperature at Saranac Lake was in the 80's. On the 27th the mercury stood at 85 degrees, with a strong south wind blowing; and on June 6 and 7 it reached over 90 degrees in the shade.

In the early spring this year, soon after the ground was free from snow, several small fires occurred; but as usual in other years these were quickly extinguished by the firewardens and their men before the flames had attained any headway or done any damage. In the latter part of April forest fires broke out with alarming frequency along the lines of the New York Central, the Chateaugay, the New York & Ottawa, and the Saranac & Lake Placid [now the Delaware & Hudson] railroads.

At first the firewardens extinguished these railroad fires wherever they appeared, but the locomotives continued to throw sparks and start fresh ones faster than the men could attend to them. The dead leaves, bushes, undergrowth, stumps, logs and leafless trees became so dry that it was only by the utmost exertion, combined with skillful, experienced methods, any one fire could be controlled. The conditions were such that incipient fires sprang up in the wake of nearly every railroad train. The line of the New York Central, from Fulton Chain to Mountain View, was bordered with smoke and flames, except on the eight-mile stretch through the private preserve of Dr. W. Seward Webb, where a large number of patrols were employed at his expense to follow each train, night or day, and extinguish the locomotive sparks that fell along the road.

The New York Central, during the time of greatest danger, placed a patrol on every mile of its line at its own expense, but one other railroad neglected the work. The leading cause of fires was sparks from locomotives. The number of fires due to each of the leading ascertained causes was as follows: Railroad locomotives, 121; burning fallows, 88; from other fires by wind, 61; fishermen, 47; tobacco smokers, 23; hunters, 7; incendiaries, 6; camp fires, 6.

Fires were fought with the utmost vigor, and every known method of extinguishing or checking, from beating them out to back-firing, was employed. The firewardens ordered out 6,487 men, all told, and the total number of days paid for in fire fighting in the Adirondacks alone amounted to 77,290. Practically the whole male population of large sections was engaged in this work.

The number of acres of timber land burned in the Adirondacks in the summer of 1903 was 292,121; the standing timber destroyed was valued at $666,207, and logs, pulpwood, etc., at $145,457. Out of the total timber land acreage burned but 33,698 acres belonged to the State, or about ten percent of the total State holdings. In the Catskills 20,469 acres of timber land were burned over, of which only 100 belonged to the State. The value of standing timber destroyed was $29,075, and of pulpwood, etc., $7,934. While the cost of fighting the fires in that calamitous year of 1903 was heavy, it was, in comparison to the saving of property hardly more than infinitesimal, in addition to which it was the salvation of the entire Adirondack region as a resort section and as the feeder of the leading rivers of the State.

THE FOREST PRESERVES AS LUMBER PRODUCERS.

The Forest, Fish and Game Commission of New York is required by law to furnish annual reports as to the product of the regions in which the preserves are situated. These reports, which go back to and include 1890, are not only interesting from the standpoint of historical records, but indicate somewhat as to the effect of the adoption of forestry methods in a timbered section. While only a portion of the Adirondack and

AUGUSTUS SHERMAN

A LEADER IN A GREAT INDUSTRIAL DEVELOPMENT

BORN AT ARLINGTON, VERMONT, FEBRUARY 11, 1801. DIED AT GLENS FALLS, NEW YORK, NOVEMBER, 1884

[SEE PAGE 407]

Catskill forests are thus preserved, the area under the control of the Forest Preserve Board is large enough to have an adverse effect upon the output of forest products, if such were its influence. The following tables give the annual product of the Adirondack and Catskill forests respectively:

ANNUAL PRODUCT OF THE ADIRONDACK FOREST.

Year	Sawlogs, feet board measure.					Pulpwood, feet board measure.	Wood for cooperage, chemicals, etc., feet board measure.	Grand total, feet board measure.
	Spruce.	Hemlock.	Pine.	Hard-woods.	Total.			
1890	210,270,932	94,145,695	15,438,163	5,835,844	325,690,634	51,956,262	.....	377,646,896
1891	179,135,432	77,789,833	21,183,354	8,601,974	286,710,593	69,274,283	.....	355,984,876
1892	279,668,903	96,290,388	23,002,469	7,992,440	406,954,200	80,918,537	.....	487,872,737
1893	241,581,824	77,910,654	27,844,222	7,713,828	355,050,528	92,135,707	.....	447,186,235
1894	.....	.....	.....	.....	288,700,269	112,095,918	.....	400,796,187
1895	.....	.....	.....	.....	297,610,161	151,891,281	.....	449,501,442
1896	.....	.....	.....	.....	270,215,372	159,894,054	.....	430,109,426
1897	188,353,586	55,656,579	26,120,055	14,777,324	284,907,544	166,087,872	.....	450,995,416
1898	216,920,594	46,611,412	33,236,410	17,883,873	314,652,289	229,581,918	.....	544,234,207
1899	148,203,491	46,545,772	33,132,807	24,296,554	252,178,624	195,568,623	.....	447,747,247
1900	166,614,856	48,377,575	54,948,590	32,748,759	302,689,780	230,649,292	.....	533,339,072
1901	154,430,030	63,809,318	46,043,091	36,452,529	300,734,968	237,483,126	6,036,804	544,254,989
1902	148,859,311	60,177,715	40,218,643	34,851,571	284,107,240	253,531,494	34,383,870	572,022,604
1903	159,764,700	53,384,050	28,906,000	47,412,090	289,466,840	289,125,600	.....	578,592,440
1904	174,905,025	63,938,800	38,031,460	55,879,479	332,754,764	262,100,835	56,155,563	651,011,162
1905	203,589,532	73,051,932	59,838,239	78,817,818	415,297,521	294,582,420	28,020,960	737,900,901

Year.	Shingles, pieces.	Lath, pieces.	Year.	Shingles, pieces.	Lath, pieces.	Year.	Shingles, pieces.	Lath, pieces.
1894....	18,683,000	32,453,000	1898...	27,273,000	49,933,000	1902...	32,826,000	45,987,000
1895....	18,267,000	34,295,000	1899...	33,619,000	49,329,000	1903...	31,516,450	52,659,692
1896....	16,256,000	21,050,000	1900...	32,734,000	56,840,000	1904...	37,716,250	53,754,700
1897....	35,623,000	47,661,000	1901 ..	32,628,000	51,528,000	1905...	37,573,250	58,517,200

ANNUAL PRODUCT OF THE CATSKILL FOREST.

Year.	Sawlogs, feet board measure.					Chemicals, cooperage, pulp, etc., feet board measure.	Grand total, feet board measure.
	Spruce.	Hemlock.	Pine.	Hard-woods.	Total.		
1900.....	2,730,780	18,659,026	9,340,448	25,876,089	56,606,343	.....	56,606,343
1901.....	2,578,000	18,825,358	9,185,346	27,314,452	57,903,156	57,224,466	115,127,622
1902.....	.....	.....	.....	.....	58,618,352	60,078,178	118,696,530
1903.....	1,451,910	15,732,340	7,669,400	21,273,750	46,127,400	74,567,920	120,695,320
1904.....	.....	.....	.....	.....	72,370,477	65,833,884	138,204,361
1905.....	2,933,393	23,504,688	12,530,468	41,250,682	80,219,231	70,914,879	151,134,110

Year	Shingles, pieces.	Lath, pieces.	Railroad ties, pieces.	Headings, pieces.
1900.....	4,871,500	5,158,700	.....	.....
1901.....	5,519,750	4,867,800	.....	.....
1902.....	4,698,000	4,454,000	.....	.....
1903.....	10,259,660	5,261,000	26,040	5,946,800
1904.....	4,562,750	5,047,400	.....	.....
1905.....	2,058,000	2,582,100	.....	.....

It will be seen that in 1905 the output of sawlogs was larger than in

any previous year within the scope of the tables, though not much larger than in 1892, which was a year of extraordinary demand and business activity. The pulpwood business was comparatively small at the beginning of the period covered by these tables, but soon developed large proportions. It is this industry, together with some other important wood consuming lines, which chiefly threatens the perpetuity of the Adirondack forest. It is still a menace to private holdings which are not operated in accordance with approved forestry methods; but the control of large areas by the State and the growing adoption of methods designed to perpetuate forest growth by private owners promise to maintain the Adirondacks as an important factor in the supply of the markets of the country.

That a total of 515,300,000 feet of sawlogs and of 737,900,000 feet board measure of all classes of products could be derived from this region, which for 100 years has been sending out its contributions to the needs of civilization, lends some measure of assurance to the hope that similar methods adopted elsewhere in the important timbered regions of the United States may preserve in large measure the forests and their products for the benefit of future generations.

FOREST PRODUCTS OF NEW YORK IN 1905.

Previous to 1905 the annual reports show only the lumber production of the Adirondack and Catskill regions. In 1905, however, a census was taken of the production of all the mills outside of these two regions, with the result shown below:

LUMBER PRODUCTION OF FARMING COUNTIES FOR 1905.

Sawlogs:			
Spruce	4,553,549		
Hemlock	82,993,198		
Pine	39,701,244		
Hardwoods	127,515,722		
Total		254,763,713	
Wood for excelsior, cooperage, wood acid, etc.		68,271,444	
Grand total, feet			323,035,157
Shingles, pieces			13,742,750
Lath, pieces			6,809,000

The above table, covering as it does all those lumber producing sections west of the eastern forests, including the headwaters of the Delaware, the Susquehanna and the Allegheny, shows, when combined with figures in the previous tables, a total production of sawlogs for 1905 amounting to 750,280,465 feet. This quantity is materially larger than the product of 1904, as ascertained by the United States industrial census of 1905, which reported a total for New York State of 581,976,000 feet of rough lumber. That census, however, omitted custom sawed lumber. It is possible,

also, that in the sawlogs reported by the State board are some which were not actually converted into lumber, but found other uses. This quantity compares somewhat closely with the United States census of 1900, in which the rough lumber product of New York State for 1899 was given as 874,754,000 feet.

It seems fair to conclude, therefore, that the State of New York, after 300 years of utilization of its forest resources, is still producing three-quarters of a billion of feet, most of which comes from the Adirondacks; and that, with the continuation and extended application of the present wise forest policy, such a product will be indefinitely maintained.

AUGUSTUS SHERMAN.

One of the most notable lumber operators in the State of New York during the period of the greatest activity and largest production in the Adirondacks was Augustus Sherman, of Glens Falls, Warren County, New York, a portrait of whom is presented opposite page 404.

He was born at Arlington, Vermont, February 11, 1801 his parents being Ware Darwin Sherman (related to Roger Sherman, of Revolutionary fame) and Anna D. (Canfield) Sherman. When five years old his parents removed to Kingsbury, New York, and in the following spring to what is now Luzerne, in Warren County, on the Hudson. His father was a lumberman and farmer and the boy early became used to hard and rough work. Before the Glens Falls feeder was constructed to supply water to the Champlain Canal from the Hudson River, while still a boy, Augustus Sherman hauled lumber by team from Corinth or Big Falls, rafted it in cribs to the Bend, from thence drew it to Fort Edward, whence it was rafted to Troy. With the opening of the Glens Falls feeder he was among the first to operate a boat on its waters in transporting lumber. Before he was fifteen he carted lumber to Troy and Albany, attended to its sale and purchased supplies.

His first venture for himself was running an old "English" mill, situated on a small tributary of the Hudson in the town of Luzerne. He also ran a grist mill. Three years later he took the Butolph sawmill lower down the river. In the winter of 1840–1, having disposed of his business in Luzerne, he removed to the feeder dam, one and one-half miles from Glens Falls, where he resumed the manufacture of lumber on a larger scale. Two years later he removed to Glens Falls, which thereafter was his permanent residence. At this time began his timber land investments, the first being a purchase in the Sixteenth Township, in Hamilton County. Thereafter he was almost uniformly successful, and year by year his lumber operations became more extended, although his conservatism was always a check on speculative transactions.

Mr. Sherman became a prominent factor in the financial and manufacturing enterprises of his locality. He was the first president of the Glens Falls Paper Mill Company, also of the Bald Mountain Lime Company, and the owner of the Sherman Lime Company and the South Glens Falls Flouring Mill. He was president of the First National Bank of Glens Falls from 1858 to his death, in 1884. With F. A. Johnson as cashier, Mr. Sherman for years conducted the private bank of Sherman & Johnson. He was the organizer and at the head of the wholesale firm of L. Thomson & Co., of the Albany lumber district, Mr. Thomson being his son-in-law. He was also at the head of the lumber manufacturing firm of Sherman, Lord & Hurdmans, of Hull, Quebec. With George W. Sisson, under the firm title of "The A. Sherman Lumber Company," he manufactured lumber on a large scale on the Raquette River, at Potsdam, New York, where he also owned and operated individually another lumber mill. At various times he conducted large mercantile affairs at Glens Falls, his son-in-law and two sons, William and D. W. Sherman, being associated with him. He owned much valuable real estate in Glens Falls and timber lands in Hamilton and St. Lawrence counties.

On March 4, 1824, he married Miss Nancy Weed. Nine children were born to them, seven of whom grew to maturity. His wife died in 1848, and in 1856 he married Miss Charlotte H. Conklin. Mr. Sherman's success in business was due to his persevering energy and sound judgment. He was always cautious, never expanding operations beyond his own financial control. He was of resolute and rugged character, demanding of others the industry and integrity which he himself displayed,

CHAPTER XXIV.

NEW YORK—ALBANY.

The capital city of the Empire State is one of the oldest lumber markets of the country, and for about a quarter of a century claimed the honor of being the largest wholesale white pine market. It is still among the largest handlers of that wood, but many years ago Albany took off her laurels and handed them to Chicago; and today scores of cities widely scattered might be named as surpassing Albany as a general lumber market. But long before Chicago reared her enterprising head, or Saginaw approached her zenith as a manufacturing point, Albany handled her millions of feet, and not the least of her glory therein was the fact that her own State provided almost her entire stock. Those were the days when Chemung County produced the choicest clear lumber and when it was given away for the trifling sum of $20 a thousand. However, as long ago as 1880, in the report of the tenth United States census[1] the statement was made that white pine was the variety of lumber most largely handled at Albany, two-thirds of it coming from Michigan and one-third from Canada, "the white pine contributed by New York being an inappreciable quantity."

The question might be asked, not inaptly, What made Albany a lumber market? And the answer could be made, The Albany market grew; it was not made. The Erie and Champlain canals and the Hudson River generated, as it were, and fostered a lumber market in the old Dutch town. It was water communication, in the days when railroads were not or were few and far between, that turned the lumber trade to this point, and it is water transportation that has kept the market alive for over a half century. A writer on the subject in 1887 had the following to say in this connection:

> Take away the canals and the river and give Albany only railroads, and the wholesale trade here would soon dwindle to nothing. As one of the dealers there remarked, "We are all water fowl in Albany." In this particular Albany has better facilities for handling lumber at a low cost than any other wholesale market in the country. Lumber from the West, or from the North, arriving by boat, is run right into the midst of the yards by the means of slips, and the cargoes shoved into pile by the boat hands themselves, who practice the extreme kindness of assorting the lumber for nothing. That is to say, $1.75 is this season [November, 1887] paid by the dealers for bringing

[1] C. G. Pringle's report upon the forests of northern New York, in the "Tenth Census of the United States," 1880.

lumber from Tonawanda to this point, which rate includes loading, unloading, assorting and piling. Such superabounding benevolence on the part of the skippers, if evinced on Lake Michigan, would make the dealers think that the entire lake marine and the irrepressible "shovers" had gone crazy in a crowd. It costs ninety cents a thousand to bring forward lumber from Glens Falls, about fifty miles—a high rate, but it includes loading and unloading. This unrivaled facility for receiving and dispatching lumber is what is enabling the Albany dealers to hold their own against an appalling competition that has sprung up within the last two or three years. Albany dealers can run lumber through their yards at an expense of only about eighty cents a thousand, while Chicago merchants have to pay $2.25 to $2.50 a thousand

THE ERIE CANAL.

The most potent factor in Albany's growth as a lumber market was the Erie Canal, an undertaking that was nothing less than stupendous for the day in which it was accomplished. The credit for the success of this gigantic project was largely due to De Witt Clinton, and at the time and for many years thereafter the canal was referred to as "Clinton's Folly," though the idea of such a waterway was born in the brain of Gouverneur Morris. The idea was first made public in 1800, and in the fall of 1825 the canal was completed. It furnished an outlet for merchandise coming from all the Great Lake region to the Atlantic by way of Hudson River, extending from Buffalo, on Lake Erie, to Albany, on the river, a distance of 352 miles. It had seventy-two locks, a width, at first, of forty feet and a depth of four feet; later, it was enlarged to seventy feet at top, fifty-six at bottom and seven feet deep. In 1896 steps were taken to increase the depth to nine feet, but in about a year from the time the work was begun the money for the carrying out of the purpose, $9,000,000, was exhausted and the work only partially done. Since that time elaborate plans have been made for both widening and deepening the canal so that barges of 1,000 tons can navigate it, and in November, 1903, the proposition was voted upon favorably by the people. It is said that this work will cost $101,000,000. The original cost of the canal was $7,602,000, and up to 1906 the improvements had brought the figures up to $52,540,800. Now (1907) the work of creating the "1,000-ton barge canal" is in progress.

THE LUMBER DISTRICT.

To this great canal can be attributed the possibilities of the Albany district as a lumber distributing center; however, for years after the opening of the canal the local supply of lumber was so plentiful in all sections as to render great distributing plants unnecessary. It was not until 1853 that Albany began to assume importance as a lumber distributing center. It was then that the pioneer lumbermen of that locality commenced to buy the splendid white pine lumber produced in southwestern New York, notably in Allegany and Chemung counties, and to transport it to Albany for assortment and sale. The canal boats employed

in those days carried from 40,000 to 50,000 feet of lumber. This lumber was transferred from canal boats at Albany over what was known as the "long pier" to sloops and schooners which transported it down the Hudson to New York and to coastwise points everywhere from Boston, Massachusetts, to Darien, Georgia.

The business grew far beyond the facilities and capacity of the "long pier" and a few years later the Van Rensselaer interests began the establishment of the Albany lumber district, a map of which, made in 1888, is shown herewith. This estate owned a strip of land, approximately a mile and a half in length and from 400 to 1,000 feet in width, lying between the Erie Canal and the Hudson River. This strip was docked on both sides and penetrated with scores of slips from the canal, thus dividing the area into lumber yards for the convenient handling of lumber from canal boats into pile, and eventually from pile to schooners and barges on the river side. Nearly all the slips were just wide enough to let a canal boat in. As a rule, the docks between the slips, on which the lumber was placed, were only wide enough for two rows of piles and a roadway between. In piling there was no carting back of lumber—it was shoved from the canal boat into the pile. This handiness was probably what made the boat hands so good natured about doing all the work. Formerly it was the almost exclusive custom to load boats for shipment southward on the river front; but about the year 1886 began the practice of taking boats up out of the river, through locks, into the canal and thence into the slips for loading. This lessened the cost of handling considerably, for it did away with the expense of carting to the river front. During the season of 1887 about two-thirds of the lumber shipped was loaded in the slips. It could all have been thus loaded had it not been for the size of some of the barges, which were built wide and capacious so that they could go out on Long Island Sound to deliver lumber to such points as New Haven, Hartford, New London, etc. These carried from 500,000 to 600,000 feet and were pulled in strings down the Hudson by powerful tow boats, as were the canalers.

The offices in the Albany lumber district were ranged along a street through which ran a car track. This street ran between the ends of the slips and the Hudson River wharf front. The yards were so narrow that the offices stood as thickly as the dwellings on a village street. The horse cars passed the very doors of the offices every fifteen minutes, affording excellent means of reaching any yard in the district with but little delay. The offices were built in all styles of village architecture, many of them looking as if they were built on purpose for the summer resorts which they were, verandas and all; for when the frost congealed canals and rivers the dealers gathered up their account books and betook them-

selves to town, where, in winter offices, they straightened up their books, settled their accounts and prepared generally for another season's campaign. During the winter the lumber district was almost entirely deserted, hardly any one, aside from the few men engaged to look after the stock, venturing there.

These individual yards had a piling capacity of from 2,000,000 to 20,000,000 feet of lumber, and each slip section commanded an annual rental of from $2,000 to $4,000. From 1875 to 1880 the Albany lumber district contained an aggregate of fifty white pine distributing yards and handled as high as 700,000,000 feet of lumber annually. But this is all changed now. Probably not more than one-half of the original number of yards are doing business today in the Albany lumber district. Some of the old yards and portions of the street are grown up with weeds and grass. The white pine yards yet remaining handle probably less than 200,000,000 feet annually. Some of the firms now maintain yards in other sections of the country but still have their headquarters in the old Albany lumber district. Some have gone out of business altogether. A few still do almost as large a volume of business as formerly.

PERSONNEL OF THE LUMBER DISTRICT.

The names of the lumber "barons" who ruled for nearly a half century in the little kingdom which lies between the Hudson River and the lower reach of the Erie Canal shine out brilliantly in the history of the lumber trade of the United States. H. W. Sage, whose benefactions to Cornell have made his name imperishable, once had large yards in the district, and his sons still own immense timber limits in various parts of the country, although they have retired from the jobbing trade. L. Thomson & Co. is a firm well known in the lumber world. This firm, the original members of which have passed away, celebrated its fiftieth anniversary May 9, 1905, and was still doing a good business. Other names of prominence were Hughson & Co., Smith, Craig & Co., Clark, Sumner & Co., Sumner & Hascy, Ezra Benedict, J. Benedict & Son, William H. Weaver, Gratwick & Fryer, J. O. Towner & Son, S. B. Towner, Skillings & Whitney Bros., Patton & Co., Joshua Rathbun, Acors Rathbun, Rodney Vose, A. S. Kibbee & Son, C. P. Easton & Co., Arnold & Co., C. B. Nichols, Van Rensselaer & Co., C. P. Williams, J. B. King, Douglas L. White & Co., Clement Warren, Salisbury & Co., Higbie, Douglass & Co., Thomas & Hyatt, Nelson Salisbury, McGraw & Co., Boyd & Co., Saxe Bros., H. S. Van Santford, Phillips & Dunscomb, James Moir, J. W. Dunham & Co., Hubbell & Hill, Babbitt & Sanders, T. Murphy, H. Hunter, Taaffe Bros., Simons & Richards and Matoon & Robinson. Some of these firms have passed out of existence, but the majority of the more prominent ones still retain their entity, the business being carried on by the younger generation. C. B. Nichols began

his dealings in white pine in 1862 and is one of the two remaining members of the old guard. A. S. Kibbee, of A. S. Kibbee & Son, one of the founders of the old firm of Dalton & Kibbee, which began business in 1857, is the other surviving member. Douglas L. White, of Douglas L. White & Co., who went to Albany in 1855 from Canada, died in the early part of 1906. At the time of his death his concern controlled storage for about 10,000,000 feet, with ample slip and dockage facilities, and its average annual transactions involved handling from 25,000,000 to 40,000,000 feet. Others of the old lumber district firms that are still doing business are Arnold & Co., C. T. Hubbell & Co., Hughson & Co. and L. Thomson & Co. The present firm of F. F. Crannell, Junior, is the successor of a concern that entered the Albany lumber business in 1849. William E. Beebe succeeds the old establishment of Acors Rathbun. Prominent names that are now to be found upon a map of the lumber district but which did not appear on the old map presented herewith are T. G. Patterson, H. W. Draper, J. H. Williams, William Bennett, Easton Cypress Company and Dexter Hunter. W. J. Eaton, the Spanish River Lumber Company and Richard P. White conduct their operations elsewhere but maintain head offices in Albany.

CHANGE OF BASE OF SUPPLIES.

Albany's source of supply as a lumber market changed several times. After the exhaustion of the white pine of Allegany and Chemung counties the next source of supply for the Albany market was the southern portion of the Province of Ontario. The lumber from the mills in this district was forwarded to Buffalo by schooner and then transferred to canal boats and shipped to Albany. The quality of this pine was excellent, but, like the New York State growth, largely disappeared within a few years.

It was not until 1856 that the Albany dealers penetrated as far as Port Huron and Saginaw, Michigan, to acquire stocks of white pine lumber with which to meet the demands of their fast-increasing trade. For years thereafter the Albany dealers were the buyers of the good end of nearly all the white pine produced from Detroit up the St. Clair River and to the Saginaw Valley. Ohio dealers bought largely of the common, but Albany bought little but good. During this period Albany also became quite a factor as a buyer of black walnut, and many a cargo of the splendid Ohio growth was loaded at Toledo and Sandusky for the Albany market.

Eventually, the Albany dealers have been forced farther and farther westward for their sources of supply, and for the last quarter of a century have been buyers of good lumber wherever available—on the Ottawa River in Canada and clear to Ashland and Duluth.

It may be interesting to read, in this connection, an extract from a letter by an Albany correspondent of a lumber journal, dated 1874, showing

the change public opinion was forced to undergo regarding the source of supply of white pine for the Albany market. The extract is as follows:

To have spoken then [in the days when Chemung County furnished the bulk of white pine for Albany] of Michigan as a future source of supply would have subjected one to the audible smile of his contemporaries, and he might, with apparent propriety, have been told to go West. But, like the "march of civilization," our march has been westward for lumber, and today the pride of the Albany lumber market is her Michigan pine. Some may boast of "Ottawa stocks;" some may boast of "Canada clear," but away beyond these stands Michigan pine, the most admired, the choicest of all, and what everybody now wants when he wants the best. The more refined and advanced a people become, the greater perfection they require in everything. To this lumber is no exception, and we only follow a law of our nature when we at this day raise our voices for Michigan lumber.

THE RISE AND DECLINE OF TRADE.

The views, regarding the causes of Albany's rise and decline, of some of the pioneers of the lumber industry of that city, who are still to be found at their old posts, furnish valuable information as well as interesting reading; for these men, being on the ground when Albany was in her youth as a lumber market, sharing in her glory later when she reached the zenith of her renown and witnessing also her decline, are in a position to know whereof they speak. C. B. Nichols, one of the old-time lumbermen mentioned on a previous page of this chapter, in speaking recently of the rise and fall of the lumber trade of Albany, said:

I can remember the time when this whole district was fairly overrun with lumber. Every available inch of space was crowded with pine, spruce, hemlock and the various hardwoods. Then the barges to New York and the eastern coast stood three and four deep at the local docks, and a small army of men worked from daylight to dark piling on to them the large consignments of various grades of lumber intended for the eastern and metropolitan trade.

The early '70's were the best years in this district, although from 1880 to 1886 the business boomed. The denuding of the pine forests of northern New York and Michigan has led the trade to seek new places of supply, with the result that much of the trade has been diverted from Albany. The large mills, too, have adopted new methods of doing business. They will now ship direct to the consumer lumber in any quantity, graded to order. In the old days it was customary for a builder or contractor to buy his supply from the pile. He would often have to buy several thousand feet more than he needed in order to get lumber of the desired thickness. Now we grade lumber more carefully.

Another feature of the business is that dealers in the district do the bulk of their trade through agents located in the large centers of population and the shipments are made from the mill to the consumer. Several of the larger dealers contract for the entire output of a mill and then make their shipments direct. Hence the size of the stock of lumber kept on hand by Albany dealers is no indication of the amount of business they transact. Hughson & Co., for example, own a large mill in Ottawa and dispose of the bulk of its output to customers, direct from the mill. While the general business in Albany is very much below the average of a decade or so ago, three or four of the more prominent dealers do as much business today as they ever did. The only difference is in the method of doing it.

Douglas L. White, also mentioned before, said shortly before his death that he was under the impression that the decadence of the Albany district as a distributing center began when the bridges were built across the Hudson at Albany, thereby giving the railroads a better outlet. He said further:

Shipments which were formerly made entirely by water to New York gradually became diverted to the railroads. The result of this competition was to make shipments direct from the mills to points of consumption more practicable—a condition of affairs of which the New York jobbers were not slow in taking advantage. In the early '70's and '80's it was customary for the New York jobbers to order all their stock in the summer and have it shipped to them before the Hudson River became closed to navigation. This made it necessary for them to lease storage room in the metropolis —a very high-priced luxury. When the railroad facilities began to grow in volume the metropolitan dealers gradually turned to the mills for their supplies. Once their attention was diverted to this form of shipment, they began to pass Albany by. Purchasing from the mills, they found they would not need to lay in so large a stock for the winter, shipments by rail being possible during all seasons of the year. This made large storage sites unnecessary, with a consequent saving in rentals.

Franklin A. Jagger, managing clerk for A. S. Kibbee & Son, who has made the history of the Albany lumber district a study, contributed the following interesting matter relative to the lumber trade of that district:

The Albany lumber trade antedates the opening of the Erie Canal in 1825. From that period the industry took on more form and enterprise, and it rapidly grew till its demands made necessary a locality given up entirely to the handling and development of the trade. Its expansion was so great that the Albany lumber district at one time surpassed all other points in the amount of lumber handled and the volume of lumber business transacted.

At first it was located on the old pier opposite the center of the city. There were then no regular yards, all lumber being received on commission and resold from the boats and transferred to schooners and sloops which took it south and over east by the Sound. When winter came the office effects were moved to the mainland to escape the spring floods.

The canal gave an impetus to the trade that made necessary room for accommodation and display of the stock, and so a lumber district gradually developed, located between Quackenbush Street and the present site of Columbia Street bridge.

The industry continued to expand until it occupied a large strip of land along the river, about a mile in length, which was indented with many slips opening from the Erie Canal in the rear. The year 1872 witnessed the zenith of its influence and trade. In that year forty-three firms carried on business in the lumber district, and collectively handled approximately 660,000,000 feet of lumber, the total sales amounting to over $15,000,000. Fifteen hundred men were employed in the yards and on the docks, and $600,000 was annually paid out in wages.

While the business is still one of great volume in every way, the amount of lumber actually handled in Albany is today only about one-half that of the high-water mark of 1872. This is due to two causes: The sources of white pine from which Albany's chief supplies were formerly drawn have been denuded and the increased facilities for through shipments by rail direct from the mills to the consumer tend to reduce the amount of lumber handled in Albany. Much of this latter trade is done through Albany

houses who reap the profits on the transactions. The operations in the lumber district embrace the handling of over 200,000,000 feet of lumber, two-thirds of which is still white pine, and furnish employment for several hundred men.

The business today is mostly in the hands of the younger element, which is composed of those who have grown up in the atmosphere of the district and have become educated in the modern methods of conducting trade activities and meeting competition.

AN OLD MARKET LETTER.

Through all the years of changing conditions, so far as Albany's lumber business is concerned, there has been preserved an old market letter which the firm of C. P. Williams & Co. issued over a half century ago—in 1856. No lumber literature could be much more interesting to eastern operators, and to many in the West as well, than what is said in this circular about white pine. It is as follows:

Of this article the stock for the season is decidedly light, and from the best information we can gather, the quantity to arrive will be lighter than usual. The large advance of $5 a thousand over the rates current last year has limited somewhat the demand this year; but such limited demand this year has taken the receipts as they have arrived, and the market has been fully sustained. Prices are firm at $40, $30 and $25, except for some inferior lots and lots not seasoned, which are offered at $1 to $2 less. This description of lumber is high as compared with the previous market price; but a careful survey of the whole country from which a supply can be furnished, has convinced us that we can never expect to find it lower than at present. It must be remembered that the tree that produces clear pine lumber is the growth of at least three centuries. It can not be produced as an annual crop. The trees from which the planks are cut, which we now offer for sale, had their origin long before Columbus sailed his little barque from Palos on his voyage for the discovery of a new world; and were old when Hendrick Hudson with his *Half Moon* plowed the waters of the river which bears his name and down which we are daily shipping these slain giants of the forest. In silent grandeur, with head and shoulders above the surrounding timber growth, they have stood the sole monarch of the forest, since before the *Mayflower* landed her freight of pioneer Puritans on Plymouth Rock. These venerable denizens of our timber lands, when once lain down and hewn into planks and boards by the remorseless tooth of the mill saw "we ne'er shall see their like again" on that soil; and the extent of territory that produces such is very limited and daily growing less. The quantity of pine timber, cut in the northern tier of states and Canada, is probably not less than 5,000,000,000 feet annually, cutting over 250,000 to 300,000 acres. At this rate it is easy to compute the duration of our pine forests. The trade will pardon us if this view of the subject leads us to place a value upon pine timber and lumbering prospects above that of the community at large.

LACK OF RAILROAD FACILITIES.

As has been mentioned before, lumber handling at the Albany lumber district has always been very largely a water shipment proposition. After the completion of the Hudson River Railroad a moderate volume of business was done by car, but Albany has never been known as a car trade market. It has always received its lumber by canal boats and forwarded it by sloops and schooners. The question of putting railroad tracks in the district connecting with the roads entering Albany, thus

making rail shipments feasible, has been discussed many times. Some contended that this was the only way in which Albany would be able to compete with the western lumber dealers, who were given the advantage of cheap through rail shipments to New York City by the railways. Others opposed putting railroad tracks in the lumber district, fearing fires would result from the use of locomotives, and it was not until 1906 that the rails were laid in the Albany lumber district.

In 1887 a correspondent of a lumber paper, writing on "Albanian Peculiarities," had the following to say regarding the fact that Albany yards had no track facilities; notwithstanding that feeling on the subject was so strong, nearly twenty years passed before action was taken:

It is something to wonder at that the dealers there have been so apathetic about securing this advantage. It is true that the innovation of the western carload shippers has but recently developed into a serious phase. But now that western trade has become spread all over the East, and is there to stay, it seems as if Albany were voluntarily submitting to decay by not taking immediate steps to secure rail connections with their yards. Some of the younger men see this necessity and are beginning to stir up a breeze about it. If they allow the coming dull season to pass without taking effective measures to bring about the desired result, they will deserve to see their trade slipping from them.

Yet the canals and the river of Albany are not to be despised. Owing to the low cost of handling by boat, the dealers there have a peculiar advantage. Delivery by barge to New York and contiguous points is speedy. In the matter of spruce and hemlock the river is as good a means of forwarding to purchasers as any, though trade could be somewhat extended if rail facilities were added. Large shipments of Albany lumber are made to Philadelphia through the Delaware & Hudson Canal, and lumber is distributed all along that waterway. It seems like a remarkably circuitous and time-consuming route to bring lumber down the lakes, perhaps from Lake Superior, then through the Erie Canal, requiring about nine days, then down the Hudson and through the canal to Philadelphia. Yet a good deal of lumber makes that journey in reaching the consumer. This peculiar feature of trade illustrates how much force there is in the laws and lines of traffic when they once become established Not all the enterprise, dispatch and competition in price of the western trade have yet been sufficient to wrest from Albany this New Jersey and Philadelphia patronage.

Albany has also a strong hold on the upper Hudson and Black River spruce and hemlock trade. Coming down the Hudson to Glens Falls, where it is sawed, the lumber of the Adirondack region naturally seeks Albany as a distributing point. This lumber is a specialty in the market, and holds its place independently of white pine.

CHANGE IN CONDITIONS.

Taking lumber up the Hudson River to Albany would have looked like carrying coals to Newcastle to any lumberman a few years ago. Now it is an accomplished fact, and the smaller class of ocean-going vessels direct from ports on the Gulf of Mexico can be seen unloading at the lumber district almost any day. One of the leading white pine operators of Albany prophesies that, when the Panama Canal is completed, Albany lumbermen will sort, sell and ship on canal barges Pacific Coast lumber

for customers at Chicago, Duluth and other upper lake points from which they are now drawing their chief supplies of white pine.

MACHINE DRESSED LUMBER.

In connection with the development of the white pine industry, Albany is also celebrated in being practically the pioneer in the development of machine dressed lumber. It was between 1840 and 1845 that John Gibson installed a primitive Woodbury patent rotary knife planing machine in a small plant at Albany. Here he dressed lumber for the trade on one side only, and received four cents for each board or plank that was dressed. He made money so rapidly that he became the envy of everyone associated with the lumber business. His rights to the Woodbury patent, which afterward were involved in such strenuous and lengthy litigation, were supposed to be exclusive and he was not subjected to competition. Therefore, it was a matter involving great excitement when, in 1848, a second planing mill was erected in Buffalo, and in this plant was installed a fixed knife machine. By means of driving rolls the lumber was forced against these fixed knives and thus smoothed. The first specimens of the work of this machine were excellent in quality, and the downfall of the Gibson plant was freely prophesied. It soon became manifest that, while the fixed knife machine was capable of dressing straight grained uppers in a satisfactory manner, it was utterly unable to manipulate lumber that was in any wise gnarly or knotty. The fixed knife plant ended in failure.

INCREASE IN PRICE OF WHITE PINE.

The quality of white pine received from the northern New York, Michigan and Canadian mills is not nearly so high as it was in former years. About 1895 the average carload of lumber would run from 17 to 20 percent clear lumber; now the dealer is fortunate if he gets more than from 3 to 5 percent. This is due to the comparative scarcity of the material, and to this cause is also due the increase in price, notwithstanding the decrease in quality. The prices of pine lumber for the years 1870, 1880, 1890 and 1900 show comparatively little change—a gradually increasing scale—but the jump between 1900 and 1905 was nothing short of revolutionary. The following price list of various grades of white pine shows the changes during that quinquennium:

PRICES OF WHITE PINE.

	1900.	1904.	1905.
1-inch uppers	$53.00	$80.00	$80.00
1¼, 1½ and 2 inch uppers	60.00	80.00	80.00
2½ and 3 inch uppers	68.00	83.00	85.00
1-inch selects, uppers	44.00	72.00	72.00
1¼, 1½ and 2 inch uppers	55.00	72.00	72.00
2½ to 3 inch selects	62.00	75.00	75.00
1-inch fine common	40.00	60.00	62.00
1¼, 1½ and 2 inch common	44.00	62.00	65.00
1-inch No. 1 cuts	34.00	55.00	50.00
1¼, 1½ and 2 inch cuts	42.00	55.00	55.00

The following table shows the quantity of lumber on hand at Albany on January 1 of each year from 1873 to 1882, inclusive. A comparison of the figures shows that the greatest quantity of pine on hand was in 1881, 114,977,000 feet; the hardwood supply was largest in 1876, 6,652,000 feet, and of spruce and hemlock in 1879, 30,614,000 feet.

LUMBER ON HAND AT ALBANY FOR THE YEARS 1873–1882, INCLUSIVE.

Year.	Pine, feet b. m.	Hardwoods, feet b. m.	Spruce and hemlock, feet b. m.
1873	79,242,000	4,972,000	26,395,000
1874	90,996,000	5,594,000	16,992,000
1875	67,704,000	5,355,000	16,875,000
1876	67,800,000	6,652,000	8,336,000
1877	75,589,000	5,495,000	12,321,000
1878	69,547,000	3,645,000	22,432,000
1879	68,766,000	2,231,000	30,614,000
1880	76,463,000	2,097,000	5,415,000
1881	114,977,000	2,689,000	2,317,000
1882	101,587,000	3,205,000	6,256,000

The figures showing the receipts of lumber by canal at Albany from 1870 to 1891, inclusive, are shown below. By comparing the figures for the different years it is readily seen that, as has been stated before in this chapter, the year 1872 was the banner year of Albany's first period of growth. From that date trade declined somewhat until the '80's, when it again took a decidedly upward trend, the receipts during 1884 surpassing those of any other year. Since that time they have fluctuated. The table is as follows:

RECEIPTS OF LUMBER AT ALBANY, BY CANAL, 1870–1891.

Year.	Feet b. m.	Year.	Feet b. m.
1870	415,000,000	1881	464,000,000
1871	421,000,000	1882	450,000,000
1872	438,000,000	1883	452,000,000
1873	346,000,000	1884	477,000,000
1874	341,000,000	1885	467,000,000
1875	290,000,000	1886	435,000,000
1876	289,000,000	1887	435,000,000
1877	330,000,000	1888	392,000,000
1878	309,000,000	1889	423,000,000
1879	318,000,000	1890	406,000,000
1880	362,000,000	1891	366,000,000

The figures in the two following tables are taken from the report for 1906 of the Superintendent of Public Works of the State of New York. They show the quantity, in tons, of articles which have come to the Hudson River from the Erie and Champlain canals and their feeders, from 1837 to 1906, inclusive, and the quantity and value of all articles moved on the canals, regardless of destination, during the same period. In the first table it will be seen that 1872 was the banner year for the products of the forest, 1,467,865 tons going through the canals. In the second table the total movement of forest products reached its zenith, so far as quantity was concerned, in 1892, when 2,249,381 tons, valued at $18,571,008, was moved. In the year 1872, although the total tons moved was less than that moved in 1892 the valuation of the product was considerably more, 1,950,798 tons, valued at $35,599,734. Following are the figures:

TOTAL TONS OF EACH CLASS OF ARTICLES WHICH CAME TO THE HUDSON RIVER FROM ERIE AND CHAMPLAIN CANALS, ETC., FROM 1837 TO 1906, INCLUSIVE.

Year.	Products of the forest.	All articles, including forest.	Year.	Products of the forest.	All articles, including forest.
1837	385,017	611,781	1872	1,467,865	3,647,944
1838	400,877	640,481	1873	1,308,471	3,376,649
1839	377,720	51,559	1874	1,192,681	3,223,112
1840	321,709	36,178	1875	813,275	2,608,777
1841	449,095	36,953	1876	890,725	2,426,182
1842	321,480	666,626	1877	978,366	2,986,812
1843	416,173	836,861	1878	1,120,666	3,637,101
1844	545,202	1,031,395	1879	1,043,970	3,286,176
1845	607,930	1,204,943	1880	1,202,207	4,067,402
1846	603,010	1,362,319	1881	1,367,938	3,065,839
1847	666,113	1,744,283	1882	1,397,816	3,068,152
1848	603,272	1,447 905	1883	1,403,174	3,162,497
1849	665,547	1,579,649	1884	1,097,450	2,631,190
1850	947,768	2,033,863	1885	1,284,213	2,715,219
1851	913,268	1,977,151	1886	1,202,190	3,215,177
1852	1,064,677	2,234,822	1887	1,206,279	3,158,923
1853	1,340,261	2,505,797	1888	1,074,279	2,584,661
1854	1,103,018	2,223,743	1889	1,065,747	2,623,836
1855	877,805	1,895,593	1890	1,086,408	3,024,765
1856	858,771	2,123,469	1891	817,228	2,286,855
1857	798,986	1,617,187	1892	997,436	2,366,519
1858	817,613	1,985,142	1893	784,052	2,565,845
1859	1,123,607	2,121,672	1894	676,155	2,256,895
1860	1,137,873	2,824,877	1895	649,605	1,603,745
1861	690,586	2,980,144	1896	603,545	2,073,378
1862	968,062	3,402,709	1897	634,618	1,878,218
1863	1,049,559	3,274,727	1898	527,830	1,544,573
1864	1,106,148	2,805,257	1899	584,668	1,665,217
1865	1,051,616	2,730,181	1900	444,719	1,340,631
1866	1,329,884	3,305,607	1901	382,822	1,254,403
1867	1,359,287	2,029,695	1902	336,242	1,203,084
1868	1,459,353	3,237,149	1903	293,425	1,158,539
1869	1,453,419	3,096,142	1904	253,525	938,691
1870	1,465,517	3,156,302	1905	328,517	1,070,343
1871	1,347,979	3,495,801	1906	320,177	1,071,072

TOTAL MOVEMENT AND VALUE OF ALL ARTICLES ON ALL THE NEW YORK STATE CANALS FROM 1837 TO 1903, INCLUSIVE.

Year.	Products of the forest.		All articles, including forest.	
	Quantity, tons.	Value.	Quantity, tons.	Value.
1837	618,741	$ 6,146,716	1,171,296	$ 55,806,288
1838	265,089	6,338,063	1,333,011	65,746,559
1839	667,581	7,762,553	1,435,713	73,399,764
1840	587,647	4,609,035	1,416,046	66,303,892
1841	645,548	11,841,103	1,521,661	92,202,929
1842	504,597	5,957,219	1,236,931	60,016,608
1843	687,184	6,653,050	1,513,439	76,276,909
1844	881,774	7,422,737	1,816,586	90,921,152
1845	916,976	6,472,237	1,977,565	100,629,859
1846	1,087,714	6,422,409	2,203,662	115,612,109
1847	1,086,880	7,546,063	2,869,810	151,563,428
1848	1,104,940	7,219,359	2,796,230	140,086,157
1849	864,373	8,671,057	2,894,732	144,732,285
1850	1,261,901	15,117,661	3,076,617	156,397,929
1851	1,993,698	12,549,754	3,582,733	159,981,801
1852	1,586,080	11,526,436	3,863,441	196,603,517
1853	1,821,525	14,001,506	4,247,853	207,179,570
1854	1,768,745	14,384,785	4,165,862	210,284,312
1855	1,534,934	10,545,615	4,022,617	204,300,147
1856	1,478,674	10,211,383	4,110,082	218,327,062
1857	1,364,002	9,827,410	3,344,061	136,997,018
1858	1,232,968	8,963,443	3,665,192	138,568,844
1859	1,542,035	10,798,769	3,781,684	132,160,558

TOTAL MOVEMENT AND VALUE OF ALL ARTICLES ON ALL THE NEW YORK STATE CANALS FROM 1837 TO 1903, INCLUSIVE.—Continued.

Year.	Products of the forest.		All articles, including forest.	
	Quantity, tons.	Value.	Quantity, tons.	Value.
1860	1,509,977	$10,654,710	4,650,214	$170,849,198
1861	1,052,392	6,462,614	4,507,655	130,115,893
1862	1,569,674	11,305,954	4,598,785	203,234,331
1863	1,628,688	13,421,909	5,557,692	240,046,461
1864	1,478,921	22,589,060	4,852,941	274,400,639
1865	1,467,315	21,011,122	4,729,654	256,237,104
1866	1,769,994	28,754,821	5,775,220	270,963,676
1867	1,744,252	28,997,470	5,688,325	278,956,712
1868	1,958,309	24,039,591	6,442,225	305,301,920
1869	1,855,930	21,930,655	5,850,080	249,281,284
1870	1,916,511	22,266,184	6,173,769	231,836,176
1871	1,941,297	27,309,303	6,467,888	238,767,691
1872	1,950,798	35,599,734	6,673,370	220,913,321
1873	1,582,072	18,651,838	6,364,782	191,715,500
1874	1,482,753	17,840,356	5,804,588	196,674,322
1875	1,250,546	12,478,669	4,859,858	145,008,575
1876	1,175,313	11,132,966	4,172,129	113,090,379
1877	1,312,526	15,574,893	4,955,963	139,411,963
1878	1,364,120	12,703,074	5,171,320	182,254,528
1879	1,368,849	12,053,499	5,362,372	285,280,726
1880	1,566,764	14,351,622	6,457,656	247,844,790
1881	1,652,543	18,399,932	5,179,192	162,153,565
1882	1,771,743	20,285,512	5,467,423	147,918,907
1883	1,828,643	18,038,056	5,664,056	147,861,223
1884	1,671,706	27,588,279	5,009,488	162,097,069
1885	1,595,632	17,032,705	4,731,784	119,536,189
1886	1,523,496	16,471,706	5,293,982	180,061,846
1887	1,529,809	15,568,667	5,553,805	159,245,977
1888	1,389,728	14,899,643	4,942,948	122,524,735
1889	1,567,311	17,012,190	5,370,369	154,584,222
1890	1,397,862	21,888,280	4,246,102	145,761,086
1891	1,206,986	17,923,469	4,563,472	116,269,343
1892	2,249,381	18,571,008	4,281,995	167,596,948
1893	1,030,604	14,421,877	4,331,963	154,831,094
1894	872,601	12,706,519	3,882,560	141,179,560
1895	947,870	14,504,441	3,500,314	97,453,021
1896	852,467	11,838,186	3,714,894	100,039,578
1897	896,971	11,780,232	3,617,804	96,063,338
1898	820,668	11,489,502	3,360,063	88,122,354
1899	838,449	14,312,288	3,686,051	92,786,712
1900	726,984	9,161,366	3,345,941	84,123,772
1901	839,191	10,697,001	3,420,613	83,478,880
1902	805,067	9,546,375	3,274,610	81,708,453
1903	690,161	9,726,311	3,615,385	77,713,325
1904	738,793	9,255,116	3,540,907	66,381,817
1905	851,098	11,640,382	3,226,896	57,918,586
1906	854,610	12,639,416	3,540,907	66,501,417

ALBANY INSPECTION.

Inspection at Albany, as elsewhere in the East, at first was a simple matter, but it was the initiative of that vast and multifarious sorting, sizing and grading peculiar to the handling of white pine. Albany grading was the forerunner and suggestion of the Saginaw cargo inspection, and was the first link in the chain of inspection systems that were adopted as the pine lumber industry progressed westward. The elaborate system that prevails in the Chicago market can trace its lineage to the original Albany inspection and classification rules.

White pine originally was divided into five qualities, viz.: Clear, fourths, box or selects, common and culls. Clear, or the three uppers,

was subdivided into three grades—first, second and third. The rules given below accurately represented the customs of the Albany market in 1879, when they were prepared, and are given herewith because of their historic value and because of the light they throw on the fundamental principles which still govern the market. The change in demand and in methods of handling in the various yards has so affected grading below fourths and so many different customs prevail that no set of rules can now harmonize the prevailing differences:

First Grade.—A first clear board shall be perfect in all respects, free from wane, knot, rot, shake or check, not less than 12 feet long and 8 inches wide (in any case), unless a very wide and thick piece, when a minimum length of 10 feet may be allowed.

Second Grade.—Not less than 12 feet in length, unless very wide and thick, with not more than two defects, i. e., two sound knots which could be covered by a York shilling (dime), or sap equal to one inch on one side, or one knot and one sap; not less than 10 inches wide, well manufactured, and free from rot, shake or check.

Third Grade.—Not less than 12 feet long, and 10 inches wide, free from rot, shake or check, unless very wide and thick, when three defects might be allowed—either three knots which a York shilling would cover, or two saps an inch wide, with one small knot. If very wide, the defects might be allowed slightly to increase, but not so as to injure the general character of the piece. These three grades are included in one, and designated clear or good.

Fourths.—Not less than 12 feet long and 12 inches wide, with not exceeding four defects at that width, viz.: If free from sap, four sound knots on the heart side not larger than a dime; if free from knots, two saps which must not exceed two inches on each edge, and must be bright. At the minimum width, one face must be perfect. With increasing width, latitude may be allowed to the extent of the sap.

Select Box.—Not less than 12 feet in length and 8 inches in width in any case. Must, if narrow, have one perfect face, and may have small knots, not exceeding five, in a width of 14 inches or more. Sap may meet on one end, for not more than one-fifth the length, or two saps may be allowed on sap side, but must have at least three inches of heart wood between; sap must be bright; must be free from rot, shake and checks.

Box or Common.—All sound lumber, free from knots, shaky hearts, rot, shake and wormholes, which is below the grades before named, shall be classed as box or common.

Pickings.—A grade of common which in its general character will dress one side clear, or has no great number of small knots, but is suitable for finishing lumber. (A good fine common, but indifferent select.)

Culls.—Will not hold water, shaky, rotten, coarse knots, black and moldy sap. If very rotten, embracing more than one-eighth of the board, it becomes a scoot, refuse or mill cull. Market culls must be good enough to make hog pens, board fences or roof boards.

Scoots, Refuse or Mill Culls.—Lumber that is not worth removing from the mill, and is fit only to be burned.

As the Albany white pine inspection was of such historical interest and practical influence another version of them, from the standpoint of an interested outsider, may be of value. In the *Northwestern Lumberman* of August 22, 1885, is found an article by William McAuley, of Saginaw, Michigan, who was familiar with the practical application of the Albany

rules. Mr. McAuley observed regarding them: "You will perceive by careful reading that the defects described as admissible in the different grades are permitted to affect them as follows: The grade of good not to exceed one-twelfth of the size of the piece; the grade of fourth, or second clear, one-eighth of the size of the piece; the grade of third clear, one-sixth of the size of the piece. (This is called select in rules.) Consequently, in any piece of lumber running over 12 feet in length, the defects as described in the rules may occupy a space in the length of the piece to correspond with the increase in length over 12 feet. There never has been, that I am aware of, any established rules in the Albany market for the inspection of six-inch strips." Mr. McAuley's version of the rules was as follows:

The qualities are divided into five grades under the names of good, fourths, select, box and shipping culls. The quality of good is divided into three grades, known as the three upper grades of good, and described as follows, viz.:

First Grade of Good.—Must be 12 inches or over in width, of soft white pine, and free from all defects.

Second Grade of Good.—Will admit of nothing less than 10 inches in width; 12 inches wide or over will admit of one split not exceeding 12 inches in length, and running parallel with the width of the piece.

Third Grade of Good.—Will admit of 10 inches in width, if free from defects. Pieces of 12 inches in width or over will admit of three perfectly sound, red, or burl knots no larger than a 10-cent piece or York shilling, if located within a space of 12 inches of one end and showing only on one face of the piece, or if free from all other defects will admit of one bright sap 2 inches in width, or 2 saps of one inch each.

Fourths (or Second Clear).—Will admit of pieces 8 inches in width, if perfect and free from all defects; 10 inches in width will admit of one perfectly sound knot not larger than a 10-cent piece, showing only on one surface, and located within a space not exceeding 12 inches from one end; pieces of 12 inches wide and over will admit of three knots perfectly sound and showing only on one face of the piece, and located within a space of 18 inches of one end of the piece, or will admit of one split parallel with the width of the piece 12 inches in length, and one knot located within a space of 18 inches in length of the piece and on same end with the split, or if free from all other defects, will admit of one bright sap three inches in width or two saps 1½ inches in width, or 2 inches in width if very thin and bright

Selects (or Third Clear).—Will admit of 7 inches in width, if free from all defects; 8 inches in width will admit of one sap not exceeding one inch in width and very thin; 9 inches in width will admit of one sap not exceeding 1½ inches in width and very thin and bright; 10 inches in width will admit of three knots perfectly sound and not larger than a 10-cent piece or York shilling, and located within a space of 12 inches from one end, and showing only on one side; 12 inches in width or over will admit of same defects as the 10-inch piece located within a space of 2 feet of one end and showing only on one face, the other face clear, or if free from the described defects, will admit of one bright sap 4 inches in width or two saps of 2 inches in width each, or if free from all other defects will admit of a closed sap on one face 2 feet in length of the piece if so light and thin that one-half will dress out.

Box (or Common).—Includes all sound lumber not admissible in the above described grades.

Shipping Culls.—Include loose or unsound heart boards, coarse branch knots, bad shakes, loose and black knots, wormholes, dead pine wormy lumber, bad stained saps, rot, and uneven and badly manufactured lumber.

Mill Culls.—Include all lumber so defective as to be unfit for merchantable purposes, such lumber not quoted as a grade, but termed cullies or scoots.

CHAPTER XXV.

CENTRAL AND WESTERN NEW YORK.

The long contest of Great Britain and France for primacy in the New World, and its settlement by the Treaty of Paris in 1763, had marked effects upon the development of the territories involved. Prior thereto English settlements north and west of the Mohawk River had been precarious; but with English supremacy definitely established the line of the frontier began to move rapidly westward. The river towns which lay along the Hudson were passed by and the intrepid pioneers were lured by the call of the forests beyond. These settlements continued to spread until the outbreak of the Revolution, when conquest of the forests was exchanged for Indian warfare as well as the epochal contest with the forces of Great Britain. When that contest reached a conclusion, development again proceeded until, by the end of the Eighteenth Century, almost the entire State of New York was well dotted with the farms, villages and towns of white settlers.

Previous chapters have been devoted chiefly to eastern New York, consisting of the Adirondacks—in fact that whole great area roughly bounded by the Mohawk, Lake Ontario, the St. Lawrence River and Lake Champlain—the Catskills, and the fringe of counties along the Hudson, including Long Island. This chapter will relate to the great area west of that section, which for want of a better title is called central and western New York.

Until the first quarter of the Nineteenth Century had passed, most of this territory was isolated from the eastern part of the State. The Mohawk receives but few tributaries, most of them insignificant, from the south and west, so that a line drawn from Oneida Lake eastward along the northern boundary of Madison and Otsego counties and southward along the eastern boundaries of Otsego, Delaware and Sullivan approximately follows the watersheds separating the tributaries of the Hudson or of the St. Lawrence on the east and north from the headwaters of the Delaware, the Susquehanna, the Allegheny and the streams which empty into Lake Erie. To the west the watershed lies between the streams emptying into Lake Erie on the north and into the West Branch of the Susquehanna and the Allegheny on the south.

Until the building of the Erie Canal, therefore, all this large and rich area was tributary to Philadelphia or Baltimore on the south, to the St.

Lawrence markets on the north or to Ohio River centers on the west, and only the portions of the State directly tributary to the Hudson were accessible to the important markets of New York and New England.

The entire country was timbered, most of it magnificently so. In the eastern part of central New York, in counties like Delaware, Broome, Cayuga, Chemung and others, were enormous quantities of white pine. Other sections also had great resources in this king of woods, but farther north of the Pennsylvania line and in the western part of the State, hardwoods grew with the greatest luxuriance.

Philadelphia, and other markets accessible by the Delaware River, at an early date reached north into New York for supplies of timber and lumber, but outside of the limited district reached by the upper Delaware and its headwaters development of a lumber industry of more than local importance was slow. Some lumber was manufactured and shipped down the Susquehanna and some down the Allegheny, the records showing that the adventurous boatmen of those days took lumber as far as New Orleans from western New York; but that industry was limited, and so the sawmills during the first quarter of the last century were, for the most part, purely local in their trade. The opening of the Erie Canal, however, changed all this, and since some diminution of the supply along the Hudson and its tributaries had already been seen, the lumber demand at once reached out a grasping hand into central and western New York.

The topography of the country is such that the influence of the Erie Canal, which lies near the northern shore of the western extremity of New York, was felt much farther south than a casual glance at the map would indicate. The country drained by the Delaware and Susquehanna rivers still was largely dependent upon shipments down those streams as an outlet for its lumber product; but it will be noticed that a little farther west those long, narrow lakes, which lie nearly in a north and south direction and form so characteristic a feature of the topography of central and western New York, were all made tributary to the Erie Canal which cut across or near their northern outlets. Some of the lakes themselves reach a long distance south and their headwaters extend still farther, the Genesee rising in Pennsylvania. This fact was taken advantage of.

To extend the reach of the Erie Canal trade and to render accessible important districts not naturally tributary to it, the Chemung and Chenango canals were built. The Chemung Canal connected Seneca Lake at Watkins with the Chemung River at Elmira, almost on the southern boundary of the State and on the Chemung River, only about twenty miles above its junction with the Susquehanna. This canal was about thirty miles long. From Horseheads, at its summit, was a feeder which extended to

a point a little below Corning, also on the Chemung River, which, by a dam located at Gibson, gave slack water navigation for some distance below Corning. The construction of this canal, which was commenced in 1829 and finished in 1833, drew a considerable part of the fine white pine of Chemung County to a better market in Albany, which otherwise would, of necessity, have gone down the Susquehanna.

The Chenango Canal, begun in July, 1834, and completed in October, 1836, connected the Erie Canal at Utica with the Susquehanna River at Binghamton. This canal gave an outlet for the product of the forests of Broome, Chenango and Madison counties to the Albany market. These canals are no longer in operation.

Farther west, an important early project which had a marked influence on the development of the western counties of New York was the Genesee Canal. The Genesee River, rising in Pennsylvania, flows entirely across the western part of New York. A canal was built in its valley, connecting the Erie Canal at Rochester with the Allegheny, a few miles above Olean, thus enabling shipment of the lumber product of Allegheny, Wyoming and Livingston counties to the Erie Canal at Rochester and thence east. All except a part of the northern end of this canal, however, has been abandoned. The effect of the opening of the Erie Canal and these feeders was that in a very few years, instead of being confined to the local field the lumber industry of this section had developed a wholesale shipping distribution of its product; and for twenty-five years a considerable, perhaps the larger, part of the supplies for the Albany market and for New York City, and other markets reached from Albany, came from central and western New York.

THE SUSQUEHANNA AND ITS TRIBUTARIES.

All the territory drained by the Susquehanna and its tributaries was originally forest clad; and what a noble forest it was! Giant pines stood in the glens wholly unconscious of the part they were to play in the development of the country and the despised hemlocks made dark the hillsides and hollows. By 1855 the pines had become decimated and the "worthless" hemlocks were thought worthy of the saw.

By 1790 the valleys of the Susquehanna and its tributaries had been penetrated by hardy pioneers from the south and east. Captain Joseph Leonard and his family moved up the Susquehanna in a canoe from Wyoming in 1787 and made the first permanent settlement at Binghamton, then a forest of pines. He was followed later in the year by Colonel Rose, Joshua Whitney and a few others who settled in the same vicinity. George Goodhue built a sawmill in Addison Township, Steuben County, as early as 1793, in the settlement of the Lower Canisteo Valley. This was one of the most famous pine lumber regions in New York. Millard

F. Roberts[1] said it was also a "central point and resort for all the lumbermen in the northern border of Pennsylvania and what now constitutes Tuscarora, Woodhull, Jasper, Greenwood and Hornellsville to the 'Deadwater,' as Addison was then called. And it has been told repeatedly by most reputable persons that at this time a man could walk from Addison to Hornellsville on rafts, except where there was a dam or swift waters where rafts could not be landed. And this explains the fact that the Canisteo Valley raftsmen are said to be the most efficient managers of a raft in high waters to be found in all the country."

Charles Williamson, agent for the Poultneys, built two sawmills on the Cohocton near Bath (also in Steuben County) in 1792 and later employed a number of men to remove all the obstructions on the Cohocton and Mud Creek, making them both navigable for "arks" and rafts.

In the spring of 1795 George McClure, later a man of prominence in that section and usually referred to as "General" McClure, ran an "ark" down the Cohocton and Susquehanna, with Baltimore as his objective point. The narrative of his experience as a lumberman is exceedingly interesting and is here given. He said:

I went to work and built an ark seventy-five feet long and sixteen feet wide, and in the course of the winter got out a cargo of pipe and hogshead staves, which I knew would turn to good account should I arrive safely in Baltimore. All things being ready, with cargo on board and a good pitch of water and a first rate set of hands, we put out our unwieldy vessel into the stream, and away we went at a rapid rate and in about half an hour reached White's Island, five miles below Bath. There we ran against a large tree that lay across the river. We made fast our ark to the shore, cut away the tree, repaired damages and next morning took a fair start. It is unnecessary to state in detail the many difficulties we encountered before we reached Painted Post, but in about six days we got there. The Chemung River had fallen so low that we were obliged to wait for a rise of water. In four or five days we were favored with a good pitch of water. We made a fresh start and in four days ran 200 miles to Mohontongo [Mahantango], a place twenty miles from Harrisburg, where, through the ignorance of the pilot, we ran upon a bar of rocks in the middle of the river where it was one mile wide. There we lay twenty-four hours, no one coming to our relief or to take us on shore. At last a couple of gentlemen came on board and told us it was impossible to get the ark off until a rise of water. One of the gentlemen inquired, apparently very carelessly, what it cost to build an ark of that size and how many thousand staves we had on board. I suspected his object and answered him in his own careless manner. He asked me if I did not wish to sell the ark and cargo. I told him that I would prefer going through if there was any chance of a rise of water—that pipe staves in Baltimore were worth $80 per thousand, "but if you wish to purchase and will make me a generous offer I will think of it." He offered me $600. I told him that was hardly half price of the cargo at Baltimore, but if he would give me $800 I would close a bargain with him. He said he had a horse, saddle and bridle on shore worth $200 which he would add to the $600. We all went ashore. I examined the horse and considered him worth the $200. We closed the bargain and I started for Bath. I lost nothing by the sale, but if I had succeeded in reaching Baltimore I should have cleared $500.

[1] "Historical Gazetteer of Steuben County," 1891.

The same spring Jacob Bartles and his brother-in-law, Mr. Harvey, made their way down Mud Creek with one ark and some rafts. Bartles' Mill Pond and Mud Lake afforded water sufficient at any time, by drawing a gate, to carry arks and rafts out of the creek. Harvey lived on the West Branch of the Susquehanna and understood the management of such craft.

Thus it was ascertained to a certainty that by improving those streams we could transport our produce to Baltimore—a distance of 300 miles—in the spring of the year, for a mere trifle. . . .

My next start in business was attended with better success. My brother Charles kept a small store in Bath, and in the year 1800 we entered into partnership. I moved to Dansville, opened a store and remained there one year. I did a safe business and took in that winter 4,000 bushels of wheat and 200 barrels of pork—built four arks at Arkport, on the Canisteo River and ran them down to Baltimore. These were the first arks that descended the Canisteo. My success in trade that year gave me another fair start. My brother, in the meantime, went to Philadelphia to lay in a fresh supply of goods for both stores; but on his way home he died very suddenly at Tioga Point. He had laid in about $30,000 worth of goods. I returned to Bath with my family—continued my store at Dansville—opened one at Penn Yan and sent a small assortment to Pittstown, Ontario County. At this time I purchased the Cold Spring mill site half way between Bath and Crooked Lake, with 200 acres of land, and purchased from the Land Office and others 800 acres to secure the whole privilege. Here I erected a flouring mill, sawmill, fulling mill and grinding machine. . . .

In the year 1814 I sold my Cold Spring mills to Henry A. Townsend for $14,000. I erected other mills at Bath. In 1816 I ran down to Baltimore about 1,000,000 feet of pine lumber and 100,000 feet of cherry boards and curled maple. I chartered three brigs and shipped my cherry and curled maple and 500 barrels of flour to Boston. I sold my flour at a fair price, but my lumber lay a dead weight on my hands. At length the inventor of a machine for spinning wool by water-power offered to sell me one of his machines for $2,500 and take lumber in payment. I closed a bargain with him, which induced me to embark in woolen manufacture. I obtained a loan from the State and was doing well until Congress reduced the tariff for the protection of home industry to a mere nominal tax. The country immediately after was flooded with foreign fabrics and but few woolen factories survived the shock.[2]

In 1795, as stated in the above narrative, Frederick Bartles rafted 100,000 feet of boards from his mills on Mud Creek to Baltimore. It would seem, however, that General McClure was mistaken, as shown by Bartles' own testimony. In 1800 he ran two arks from the same place, of which adventure the following record was entered by the county clerk in Volume I of "Records of Deeds."[3]

Steuben County—This fourth day of April, one thousand eight hundred, started from the mills of Frederick Bartles on the outlet of Mud Lake (Frederickstown) two arks of the following dimensions:—One built by Colonel Charles Williamson, of Bath, 72 feet long and 15 feet wide; the other built by Nathan Harvey, 71 feet long and 15 feet wide, were conducted down the Cohocton (after going through Mud Creek without any accident) to Painted Post for Baltimore. Those arks are the first built in this

[2]This narrative appears in the "History of the Settlement of Steuben County, New York," Guy H. McMasters, 1853, and was written by General McClure in the summer of 1850 at Elgin, Illinois. General McClure was then eighty years of age, having been born in Ireland in 1770, coming to this country in June, 1790.

[3]"History of the Settlement of Steuben County, New York," Guy H. McMasters, 1853.

county except the one built on the Cohocton at White's sawmill, five miles below Bath, by a Mr. Patterson, Sweeney and others, from Pennsylvania, 70 feet long and 16 feet wide, was finished and started about the 20th of March the same year.

This minute is entered to show at a future day the first commencement of embarkation in this (as it is hoped) useful invention.

By HENRY A. TOWNSEND,
Clerk of Steuben County.

Mr. Townsend differs from General McClure in placing the time of the first ark built in Steuben County. General McClure named 1795 as the date of his first venture.

BROOME COUNTY.

H. P. Smith in his "History of Broome County," published in 1885, said that large quantities of lumber were run down in arks from the Genesee country to Harrisburg, Philadelphia and Baltimore. Arks also came down the Tioughnioga bringing lumber from Cortland and Onondaga counties. The opening of the Erie Canal connected the great West with the Hudson River, and at once the tide of business turned in that direction. The same authority, writing on the lumber industry of Binghamton in 1840, said: "The amount of lumber transported annually was about 4,000,000 feet; about 1,000,000 of this quantity was sawed and sent principally to the southern markets by Christopher Eldredge; 1,000,000 by General Waterman to the eastern markets; 1,000,000 mostly to the southern markets by Colonel Lewis, and the fourth 1,000,000 by John D. Smith and Lewis Seymour."

One of the chief industries of the settlers of Broome County for many years was the manufacture and shipment of lumber. The hills back from the rivers were mostly covered with a heavy growth of timber. The village of Deposit took its name from the fact that it was an important place of "deposit" for pine lumber drawn from the Susquehanna River in winter in early days preparatory to rafting it down the river to Philadelphia in the spring. In the early days this town was the center of an important lumber district, to which logs and sawed lumber were drawn from territory covering many miles. M. R. Hulce built a mill two miles northwest of Deposit, on Butler Creek, in 1845. John O. Clark settled in Deposit in 1870 and bought the steam saw and planing mill which had been built in 1868 by Slitz & Wilcox.

The township of Colesville was originally heavily timbered and the settlers depended almost entirely on the manufacture of lumber to obtain money to supply the necessaries of life. Before the end of the first quarter of the Nineteenth Century sawmills were located in all parts of the township and the forests were rapidly transformed into pine lumber and rafted down the river. George Collington, of Centre Village, in 1884 recalled

the following mills that were in operation before the end of the first quarter of the Nineteenth Century.[4]

Two sawmills were built at an early day in the southern part of the town, which were afterward owned by Warren Doolittle and Nathan Mayhew. Peter Quick built a steam sawmill in the same neighborhood at a later date. Mr. Blatchley had a mill in the southwest part of the town, and Ansel Thurber built one near by. John Hendrickson built one on the "Doraville Creek" at an early date, and John Freeman built one on the same stream; both were long ago abandoned. Mr. Badger had a sawmill with his grist mill, and Robert Harpur and Colonel Mason also had mills. Hezekiah Stowell had two sawmills on "Church Hollow Creek." Up the Belden Creek above Harpersville, Barton Pratt had a sawmill; and others were owned by John Wakeman, Samuel Pratt, Ephriam Norcutt and Edwin Northup. Joel Morse had one known as Morse's mill, at the neighborhood called "Unitaria," and there was one at New Ohio owned by John Wiley; these are now running, as are also those of Pratt and Norcutt. . . . Isaac Highley had an early mill at Osborne Hollow and George Addis also had one at the headwaters of the Osborne Hollow Creek. One very early sawmill in this vicinity was owned by Isaac Guno. John, William and Joseph Whitaker had a grist mill and sawmill at Osborne Hollow many years ago. These numerous mills will indicate the magnitude and universality of the lumber business in early days. Prominent among the early lumbermen were Colonel Leman Mason, Samuel Badger, Jeremiah Rogers, Judson Allen, Warren Harpur and others. In those days the noble stream presented an animated scene when its tide was swollen by the regularly recurring freshets. Rafts followed rafts down the swift tide, some of them of enormous proportions, and the old pilots, who gloried in their occupation, were the prominent element in the community.

The old sawmill in the village, which is still believed to be capable of sawing lumber was probably built by Samuel Badger; it used to be known as the "Badger mill." "Squire" James B. Frazer has owned it thirty years or more, and has done a cabinet and undertaking business during that period. He sold the building beside the mill to John Ayers in 1814. L. A. & L. H. Tyrrell built a steam sawmill here in 1864. It was burned in 1878 and rebuilt, at which time L. A. Tyrrell bought his partner's interest and now runs it.

SUPPLYING MATERIAL FOR THE CAPITOL AT WASHINGTON.

It is not generally known that Broome County hardwoods and pine comprised a considerable portion of the timber put into the national legislative halls when they were rebuilt in 1816. Such is the case, however, in proof of which the following sketch that appeared in one of the county papers, under date of March 8, 1882, is given:

Anson Seymour, one of the first settlers in the northern part of Broome County died at the home of friends near Chenango Forks last Tuesday. . . . In his younger days he engaged in lumbering to a large extent and rafted a vast amount of timber down the Chenango and Susquehanna rivers to Baltimore and bay markets. In 1816, when the new Capitol was building (in Washington) Mr. Seymour had much lumber in Baltimore which had been piled there and thoroughly seasoned, as the market was dull. The dull market, however, proved to be a bonanza to him, as he finally found himself in possession of a lot of seasoned lumber needed in the construction of the new capitol building, which could not then be furnished by other persons. He was shrewd

[4] "History of Broome County," H. P. Smith, 1885.

enough to improve his opportunity by maintaining the mastery of the situation and realized a very handsome sum, said to have been about $7,000 clear profit, on his sale to Government contractors.

Barker was another township heavily timbered with pine. It is drained by the Tioughnioga River, which flows diagonally through it. Leveling this pine and rafting it down the river was the principal industry of the early settlers. John Rogers built a sawmill on the creek near his house about 1814 and manufactured large quantities of lumber. At his death his son Benjamin carried on the business. It was later sold to Charles Rogers. Asa Abbott had built a sawmill farther up the brook prior to 1814 and the grand pine forest was soon transformed into marketable lumber. Many other mills of which there is no record were scattered throughout the country. Charles Hyde, Junior, built one as early as 1800 and when it was abandoned another one was erected by the Hyde family.

Ira Keeler erected the first sawmill in the township of Chenango and later built one for Charles Stone. Prior to 1850 the steam sawmill owned and operated by Phelps & Alderman was built. A. N. Phelps and I. P. Alderman, who composed this firm, were among the largest lumber manufacturers and dealers in this region.

Sawmills were numerous on Page Brook in Fenton Township before 1820. One of the first built was owned by Elias Miller, a little above the mouth of the stream. The next one was erected by Mr. Page and Cloudy Hamilton. The third was built by Christopher Eldredge, near the mouth of Page Brook. The fourth was built by Francis Mann and the fifth by E. M. and Samuel Williamson. This mill sawed the boards for the first frame house in Fenton. The sixth mill was built by Henry Purdy. What was known as the Henry Cole mill was near that of Purdy. All of these were early sawmills, and while the pine lasted were a source of profit to their owners.

The country surrounding Choconut and Tracy creeks was formerly covered with magnificent pine and many sawmills were built at available points on the creeks to manufacture this timber into lumber. Alfred Rounds built a mill on Choconut Creek about 1849.

In the township of Conklin the timber was especially heavy and, consequently, sawmills sprang up on the creeks at available points and the Susquehanna was made a highway for getting the lumber to market. As early as 1808 Cooper Corbett was running a sawmill on Snake Creek. In the same year a man named Sherwood built a sawmill on the east branch of Fitch's Creek, near the present town of Windsor.

"Ira Corbett built his first sawmill here in 1856 and has operated it ever since. The lumber trade of the town had been vigorously prose-

cuted, however, since as early as 1815, having been largely developed by Cooper Corbett, and continued since by his son Ira. Ira Corbett built a second mill on Little Snake Creek, a mile below Corbettsville, in 1865; this was a steam sawmill and one of the best in this section. It was erected in December of the same year. In 1876 he rebuilt the Conklin mill, it having been burned. Mr. Corbett also built a mill in Binghamton and one in Pennsylvania, and has been one of the most extensive lumber dealers in the country."[5]

Theodore Burr in the spring of 1812 built a large sawmill on the south bank of the Susquehanna, about three and one-half miles above Binghamton. Millions of feet of lumber was sent by this mill to the Chesapeake Bay and other southern markets for many years.

TIOGA COUNTY.

Tioga County is generally hilly except the narrow valley of the Susquehanna and of its several tributaries. This county originally was forest clad. The hills were mostly covered with hemlock and pine and the valleys with a heavy growth of pine, oak, beech and maple. The pine was of extra heavy growth, in many instances reaching 175 feet in height and five feet in diameter.

The settlers early utilized the forests and the lumber manufactured from the pine in particular was a source of considerable income. The rivers were used to get the product to the markets. By 1890, however, most of this pine had been cut.

CHEMUNG COUNTY.

Elmira, Chemung County, admirably located on the Chemung River, a tributary of the Susquehanna, used to be in the heart of a great pine lumber producing region and was, consequently, a large market. Following the completion of the Chemung Canal in 1833, for a number of years both banks of the canal at Elmira were piled high with pine boards and shingles waiting shipment. During the hauling season long lines of teams came from over the river and up Seely Creek toward the State line, drawing the lumber manufactured in that region to market. Most of this product was shipped to Albany, and for a long time "Chemung lumber" was rated as the highest in the markets. It may be of interest to mention a few of the lumbermen who were located on the banks of the canal in those halcyon days: Samuel Barto Strange, Benjamin A. Towner, Asaph Colburn, Lyman Gibson, William Woodward, Arvine Clark, William S. Hatch (later Hatch & Partridge), Bradley Griffin, J. C. Sampson, Hiram Crane, W. E. Judson, Aaron F. Potter, William L. Gibson, Andrus & Langdon, Richmond Jones, Ward Jones, James Fairman, Henry C. Spaulding, William Halliday and William Birdsall. Of those mentioned

[5] "History of Broome County," H. P. Smith, 1885.

Samuel B. Strange located in Elmira in 1837. In 1841 he, in connection with Richard Towner, of Peekskill, and J. O. Towner, of Ithaca, operated a line of canal boats from Elmira to New York. These persons, in 1843, embarked in the lumber business under the firm name of S. B. Strange & Co.

D. H., O. H., John S. and Lewis Fitch were largely interested in the lumber business of Chemung County, probably manufacturing more than any other one concern. They first went to Elmira in 1832. John Sharp, an uncle, had preceded the boys and had built a sawmill between Elmira and Big Flats. This mill was successively in the hands of all the brothers and was conducted with much profit, cutting more than 30,000,000 feet from a tract which they owned.

By 1875 only the hemlock and some small amount of hardwoods were left, and Elmira not only lost its prestige as a lumber producing center but most of its stalwart lumbermen. At that time there were a few old-time houses left in the business, among which may be mentioned that of Thomas W. Hotchkiss, who was well known both on the Saginaw and on the docks at Tonawanda. Mr. Hotchkiss quietly, yet successfully, handled his quota of Michigan stock, amounting in 1874 to over 6,000,000 feet.

H. C. Spaulding was still in business at this time and carried lightly the burden of many years, and a widely extended lumber experience not only covering New York State but also many portions of Pennsylvania, Canada and Michigan. He sold, in 1874, 2,500,000 feet of Michigan pine, 1,000,000 feet of hemlock and hardwoods, 1,000,000 shingles and 500,-000 lath. He held in stock at this time 2,000,000 feet. In later years his business was carried on under the style of the H. C. Spaulding Company. This corporation was dissolved in 1907.

A. S. Turner manufactured, in 1874, 4,000,000 feet of pine and hemlock.

William M. Jeffers operated a circular sawmill within the precincts of the city, at which he manufactured considerable rough lumber and bill timber from logs which the farmers still found on the hillsides—a mere shadow of the former business done on that same line but a few years before. Twenty years prior to this time Mr. Jeffers had a controlling interest in several capacious mills in this vicinity which cut many millions of feet annually of an extra grade of pine.

In 1907 the lumbermen of Elmira were almost entirely local in their business, although several had lumber interests elsewhere and one was a manufacturer in North Carolina.

In the extreme southwestern portion of Chemung County the timber growth was thick and varied. To cut this timber into lumber the water power of Seely and South creeks was utilized, and from 1840 to 1844

there were eighteen sawmills in operation within the township of Southport. The greater portion of this lumber was shipped to Elmira.

A large part of the land on both sides of the Chemung River for a considerable distance above Chemung had already been cleared of its timber by the Indians when the whites began settlement. The hills and uplands, however, were thickly covered with pine. This pine was considered the very best in quality of any cut in this part of the country. Large quantities of hemlock bark, also, were shipped from Chemung Township in later years. Charles Ruggles & Son, in 1882, sold about 1,300 tons.

The building of the Chemung Canal feeder, which was constructed about 1833 and ran east and west through the township of Big Flats, was the means of extending the lumber industry in that region and it was not long before the valleys and hills had been stripped of their stock of pine and other timber to feed the wants of commerce.

A HARDWOOD REGION.

The region eastward from Cayuga Lake and extending back several miles, taking in the western portion of the south half of Cayuga County, rises from the lake by a gradual slope to a height of more than 600 feet at Poplar Ridge, four miles distant from its waters.

The sugar maple was the most abundant tree of the native forest. Next and along the border of the lake may be named the white oak. Basswood was common. Beech was frequently found in abundance on rather flat and heavy, damp soils. White elm grew on lands more moist. Hickory (*Hicoria ovata*) was widely distributed. Red oak and scarlet oak were frequent, also slippery elm, tulip tree, wild cherry (*Prunus serotina* and *P. virginiana*), red maple and black maple and hemlock, the latter growing abundantly along deep ravines. The white pine was found occasionally, but little or no chestnut. Of these trees the white hickory and the sugar maple were regarded best for fuel. White oak stood highest on the list for durable timber for various manufacturing purposes, and the wood of the tulip tree was highly valued for cabinet work and was often used for house siding. Some of the trees were very large and all of them were remarkable for their straight stems.

In second growths, where permitted, the original sorts were reproduced. No forest planting has been done in this country and the owners of timber slashed away at the original forests without apparently thinking that a race was to come after them.

In 1790 Yates County, for the main part, was heavily wooded. A few ridges formed the exceptions. These open spaces were undoubtedly burned over by the Indians for the double purpose of securing open spaces in the forest and furnishing, by the new growth, food for the elk and deer.

Of the trees in the forest the maple predominated and was one of the

principal resources of the county by the production of sugar. White oak was very abundant and there were also large quantities of hickory, black walnut, chestnut, elm, butternut, basswood or linden, poplar, and pine in some parts of Jerusalem Township, and all along Big Stream.

The first mill erected at Barrington was built by William Cummins, and remained in operation many years.

OSWEGO COUNTY.

The tree growth of Oswego County originally was dense and varied in nature. Much of the early pine of this county was cut and shipped to England, there to be utilized for masts and spars. This business at one time formed an important industry of the township of Granby. The lumber business of this township was a profitable one as late as 1860, at which time there were fifteen sawmills in operation.

Albion was another early active lumbering township in Oswego County. Much of the timber was consumed locally, yet many thousands of logs were floated down the Salmon River to other mill points. This business was further increased in 1871 by the incorporation of the Salmon River Improvement Company, which was formed for the express purpose of removing obstructions in the river.

The township of Richland in 1858 had nineteen sawmills and eight shingle mills in operation. Oswego Township was originally covered with a dense growth of heavy timber. This, however, has long since been cut and it may be said that Oswego County, as a whole, is today in a high state of cultivation.

The city of Oswego, as a lumber market, today is small from a wholesale standpoint, its trade being principally local, although through it are imported considerable quantities of lumber from Canada. In the early '70's, however, it was one of the largest white pine markets in the United States. It is reported that in 1873 its dealers handled 236,000,000 feet; but it was on the down grade thereafter, for in 1874 they handled but 210,000,000 feet; in 1875, 156,000,000 feet, and in 1876, 121,000,000 feet. In part, this was due to the depression in general business. Good mill-run lots of lumber that sold readily in 1873 for $24 a thousand feet, in 1876 dragged at $16 and $17. The grade which brought $45 in the former year was only worth $33 in the latter.

In another chapter relating to the statistical history of New York the imports of Oswego are given. They show that during the period covered, beginning with 1871, the largest year was 1873, during which the importations of sawed lumber amounted to 298,881,000 feet. A decline set in, but with the beginning of the next decade they rose to above 200,000,000 feet and thence almost uniformly declined until 1905, when the imports were but 34,167,000 feet.

One of the most important factors in the Oswego market for a good many years has been the Diamond Match Company. The Standard Oil Company, or its associated interests, maintain docks and yards there, being one of the heaviest handlers of Canadian lumber for box-making purposes, and it still has an extensive plant in the city. The National Starch Company had a large planing mill and box factory in Oswego in 1907 and in that city was also represented E. W. Rathbun & Co., among the largest manufacturers of lumber in Canada. The Post & Henderson Company is the only Oswego institution recognized as a lumber producer. This concern cut in 1906, at its mills at Benson Mines, about 11,000,000 feet of lumber, of which nearly 8,000,000 feet was spruce. Benson Mines is in St. Lawrence County, at the headwaters of Oswegatchie River.

John C. Churchill, in his "Landmarks of Oswego County," published in 1895, said of the early lumbering of Redfield Township:

> Down to the year 1830 the northern part of the town, which embraced the "Nine-Mile Woods," had no inhabitants, except one Webb who kept a road tavern deep in the forest. About 1830 settlers slowly located in and began clearing up this section of the town. The clearing away of the almost impenetrable forests led to a lumber and bark business which has continued to be extensive to the present day. What has been known as the Sanders mill road extends east and west across the town, and on this road fifty or more years ago Seymour Green built a sawmill. . . . At one period there were six mills on this road, but Thomas Sanders operates the only one now running. . . .
>
> In a business sense the town saw its greatest activity during the period when the tanneries were in operation and the various mills were producing great quantities of lumber. A steam railroad was built about 1865 from the village of Williamstown to what was known as "Maple Hill," and was extended into Redfield about two and one-half miles. It was used chiefly for transporting wood, and during five or six years large quantities were turned out. The road was abandoned and the track taken up about 1876.

Oswego County, in 1860, had 209 sawmills in operation. According to the State census of 1865 201 sawmills, with $443,050 capital invested, were in operation. In 1906 it was estimated that there were only seventeen sawmills in operation. So it will be seen that the lumbering business of today is practically nil.

ERIE COUNTY.

In the southern part of Erie County the valleys were originally covered with beech and maple, the hills with oak, elm and occasional bodies of pine, and a little farther north were large quantities of hemlock. In the center the pine increased in quantity, the land on both sides of Buffalo Creek and its tributaries being largely occupied by towering pines of finest quality. In the northern part of the county the hardwoods predominated, the low ground north of the limestone ledge being thickly covered. Large quantities of beech appeared on the Tonawanda. It is said that the

tract running east and west through the county for about ten miles south of the limestone ledge was most peculiar. Here the timber was principally oak, but a great part of the territory consisted of openings or prairies entirely bare of trees.

The first sawmill of record was built in 1805 by David Eddy, who erected a sawmill for the Indians on Cazenovia Creek, near what is now Lower Ebenezer. It furnished the first boards for the inhabitants of the south, though the crank, saws, etc., for this mill had to be transported from Albany.

The Strykerville (Wyoming County) grist mill was built in 1835 by Augustus Frank, of Wausau. The present owner, C. Hyman, bought the property in 1863. In 1868 he built the sawmill, an old-fashioned sash mill, which was run night and day through the sawing season. At that time there were about ten water mills on Buffalo Creek between Strykerville and Buffalo, a distance of twenty-six miles. At the present time only two remain—the one at Wales Center and the one at Strykerville. Both have been remodeled.

ORLEANS COUNTY.

The original forest growth of Orleans County was varied in species. On the uplands were found the beech, maple, white, red and black oaks, the tulip tree, or yellow poplar, basswood, elm, hickory and hemlock. The lowlands and swamps were covered with tamarack, cedar and ash. Some pine grew along Oak Orchard Creek and in the swamps and barrens.

On the opening of the Erie Canal a good trade in whitewood or poplar lumber was carried on, this timber being cut convenient for transportation to the canal. Good whitewood boards sold, on the banks of the canal, for $5 a thousand feet. Whitewood was a common tree in the township of Albany.

The first sawmill built in this township was put up in 1816 by Dr. William White. The first sawmill built in the county was erected about the year 1805 by Samuel F. Geer for the Holland Company, on Oak Orchard Creek.

Most of the timber in this county was considered an incumbrance by the early settlers and they felled it, allowing the trunks to lie on the ground until dry, when they were hauled into heaps and burned. The ashes of these heaps were collected and leached and made into black salts and potash.

SOUTHWESTERN NEW YORK.

Near its confluence with Oswayo Creek the Allegheny River passes from Pennsylvania into New York State and continues for a distance of about fifty miles upon its westward course before it again crosses the line dividing the states. In this part of its course it passes through Cat-

taraugus County to within five miles of Chautauqua County. Its tributaries from the north, Conewango, Ischua and Oswayo creeks, were once the highways for timber and lumber from portions of Chautauqua, Cattaraugus and Allegany counties, in which originally grew large quantities of white pine and other valuable woods.

The shores of these streams and the river as well were thickly timbered with pine of fine quality, and busy settlements sprang up along their courses in the early years of the Nineteenth Century. At Ceres, in Allegany County, Francis King began his settlement on the Oswayo in 1803, and at the mouth of Ischua Creek the settlement called Olean Point was established in 1804 by Major Adam Hoops, a veteran of the Revolution. This settlement soon became a thriving village and was called Hamilton in honor of the illustrious statesman, Alexander Hamilton; but later the post office was named Olean and the village also took that name.

This point was considered the head of navigation of the Allegheny River and many settlers were soon attracted there, believing that a large city would be built at that point. It was the place of embarkation by flat boats and timber rafts for the emigrants to Ohio and points along the Ohio River. Other settlements followed and soon the business of getting out logs and timber for the markets at Pittsburg and farther west became the principal industry for winter, and the names of Chamberlain, Watson, Brown and Zeliffe became common in all the new river towns. Others followed, and, after the canal from the Erie to Olean was completed, many more were established. At Portville, near the Oswayo, were Mersereau, Wheeler and many more. Then came Weston Bros., Willover, Barse and Van Campen at the mouth of the Ischua; and farther west others began to bring logs out of all the creeks that flow into the river.

In 1852 Weston & Mersereau built a sawmill at Portville, tearing down an old one previously owned by Wheeler & Hawley. Weston & Mersereau were succeeded in 1867 by Weston, Mersereau & Co., the latter firm consisting of the Weston brothers, John Mersereau and Eugene Leavens. The present firm is Mersereau & Co. The pine was exhausted about 1868 and since then the firm has been engaged in the manufacture of hemlock. The water mill built in 1852 was used until 1888, when a steam plant was added to operate a circular mill, which was later replaced by a band. The mill was destroyed by fire in 1900. Mersereau & Co. did not replace it but contracted with M. J. Smith to erect a band sawmill and to cut the balance of the timber. In 1905 Mersereau & Co. had about 15,000,000 feet of logs to saw. In 1906 the firm manufactured 4,200,000 feet of hemlock and 400,000 lath, which practically ended its manufacturing.

In the early days of lumbering in that vicinity, the product of the

mills was rafted down the Allegheny River and run to Pittsburg, Cincinnati and Ohio River points. Later, the Erie road provided at Olean an outlet for the product. Still later, the Genesee Valley Canal became the principal outlet. About 1872 the Western New York & Pennsylvania Railroad—now a part of the Pennsylvania Railroad System—was built, and this line is now carrying the greater part of the lumber product of this district.

The business of the A. Weston Lumber Company, Weston Mills, was one of the earliest established in that section of New York. It was founded in 1852 by Abijah, Orrin and W. W. Weston under the firm name of Weston Bros. The name of the senior member of this firm is a famous one in lumber annals. The original mill was run by water power and equipped, it is said, to cut 80,000 feet of lumber in twenty-four hours. It was one of the largest mills in the United States at that time. The old mill was burned in 1887, but was rebuilt and in 1900 was replaced by a steam mill with a capacity of 90,000 feet in twenty-four hours. In 1891 Weston Bros. were succeeded by the A. Weston Lumber Company, composed of Charles Weston, of North Tonawanda; Wallace Weston, Junior, of Weston Mills, and L. S. DeGraf, of North Tonawanda. After fifty-five years of operation this business, as a lumber producing institution, came to a final end when, on July 23, 1907, the last log was hauled into the mill by George Wickwire, who fifty-five years before had sawed the first log brought into the then new mill. When the log was put on the carriage it was sawed by the head sawyer, who had been connected with the mill about forty years.

The reservation of the Seneca Indians begins about eight miles west of Olean, near the confluence of the Tuna—as it is now called, from the name of the Indian village opposite the mouth on the right bank of the Allegheny, Tunungwant the whites called the place—with the Allegheny. The reservation extends down the river to the State line, near Corydon, Pennsylvania, a distance of forty miles, being a half mile on each bank of the river. Most of this land was heavily timbered with white pine and the Indians soon learned to sell it to the whites. In some cases they did all the work of getting the logs to the river, but in most cases they cut down the trees and sold them to the whites, who had teams for putting them into the river. The individual Indian who occupied the land and cut down the trees sold the timber and was entitled to receive 90 percent of the price agreed upon. The Seneca nation got the other 10 percent if its timber agent were alert enough to find the timber and hold it for the nation's royalties. The nation was in debt and issued orders upon its treasurer, which were paid in rotation as presented, whenever there was money in the treasury, the older orders having preference; but any order

was good to discharge obligations to the nation at any time, so that operators purchased orders of the Indians at great discounts and used them to pay for timber, etc. The agents very often acquired orders at low cost and then turned them in to settle their accounts with the treasurer, and, consequently, they were active in collecting the royalties due in money to pay the amount of their commissions or a little more, and then paid little attention to what the nation should receive.

Lumbering under these conditions became very attractive to those who understood it and the nation's timber soon disappeared and left small revenues in the hands of the Indians. Large tracts of timber remained back of the reservation and were the last to be lumbered because of the difficulty in crossing the Indian lands or of keeping up roads thereon. The Holland Land Company and other land companies were the owners until the lands became valuable for timber, oil or agriculture and passed into other hands. After the Erie Railroad was built the timber was in better demand and many new firms began operations. At Olean were Martin & Sons, Willover Bros. and many more; at Salamanca, James G. Fitts, Bemis & Ostrander and others, and along the river and its tributaries there were mills at every place convenient to store logs, especially where the railroad was available for shipping.

When the pine timber was about exhausted, attention was given to hemlock timber and large tanneries were established at Wellsville, Cuba, Olean, Allegany, Salamanca, Limestone, Cattaraugus and many other places in the hemlock belt, where bark for tanning was available. When the timber was peeled, lumbering followed and mills were constructed along the streams at places convenient for receiving logs and at good points for shipping lumber. The third of a century that has passed since 1870 has seen most of the hemlock lands in this large section stripped, and the timber that now remains is chiefly hardwood, and even that is becoming rather scarce, except in a few towns where the railroads have been too far away for profitable lumbering in such heavy material at the low prices it has commanded.

CHAUTAUQUA COUNTY.

Andrew Young, in his "History of Chautauqua County," published in 1875, gives some interesting lumber history in connection with the original town of Ellicott. He said the first mill erected within this territory was that of Doctor Kennedy in the present town of Poland, in 1805. This mill property was sold by Doctor Kennedy's heirs to Richard P. Marvin, of Jamestown, who sold it to Guy C. Irvine and Robert Falconer. It was subsequently rebuilt by Jones and Stilwell, of Jamestown. The mill next passed into the hands of Seth W. Chandler, who, in turn, sold it to Daniel Griswold and William T. Falconer, who rebuilt it in 1866 and

sold it to Wellington H. Griffith, who sold it January 1, 1871. It was burned within a year, but a new one was erected on the same site.

In 1823 the above mill was rented by William Forbes, Benjamin Runyan and William Clark from the Kennedy heirs. These men got in the logs and sawed upward of 4,000,000 feet. Many of the logs were cut in the town of Randolph and floated down the Little Conewango to the mills, and were the first logs ever floated down that stream. This lumber was sold, unassorted, for $5.50 a thousand feet to the lumber company composed of John Frew, John Myers, S. and J. E. Budlong and Guy C. Irvine. After being assorted it was estimated that one-third of these boards were clear. It was said to be one of the best lots of lumber sawed in the county and commanded the highest price at that time. The mills were crowded to their utmost capacity, two shifts being run, day and night. The sawmills in Jamestown cut about 3,000,000 feet annually, while owned by Judge Prendergast. Mr. Young says that the low price of pine lumber manufactured in the vicinity of Jamestown was almost incredible. In proof of this fact he quotes a suit before a court of justice. He said: "A man had given to another a note payable in lumber. The lumber not having been delivered at the time stipulated, the note was, of course, collectable in cash and a suit was commenced. It was proved, on trial, by several witnesses that lumber was worth on barter, $2 a thousand feet but in cash only $1.50 and judgment was rendered accordingly."

The following detailed account of the sawmill operations in Jamestown was written by Judge Foote and appeared in Young's "History of Chautauqua County." It will be found of considerable interest, particularly as it gives a vivid picture of conditions obtaining in the lumber industry of western New York 100 years ago:

When I removed to Jamestown, in February, 1815, there was a 1½-story grist mill building, with two run of stones; and two single sawmills, and one gang sawmill, all owned by James Prendergast. There was one small store of goods . . . two small shanty blacksmith shops . . . and a small outdoor tannery . . . A tavern building was commenced by Jacon Fenton.

Almost the entire business of the place, then called "The Rapids," was cutting some 3,000,000 feet of boards a year, mostly run down the river; and most of the provisions and groceries used by the people were brought from Pittsburgh in keel boats; as flour, bacon, dried apples and peaches, tobacco and whiskey; also nails, glass and castings. The mills all stood near each other on the north side of the outlet, nearly opposite the south end of Main Street. The frame sawmill next to the shore contained a single sawmill, and immediately south of it—in the same frame—a gang sawmill carrying from fourteen to sixteen saws. In a separate frame, and a little further into the stream, was a single sawmill, called the "new mill," built in 1814. The grist mill stood a little northwest of the sawmills. The single sawmill next the shore was mostly used in slabbing logs for the gang sawmill. All the sawmills were run night and day, except Sundays. They required two sets of hands; one set commencing at noon and working until midnight, the other working from midnight until

noon. The gang required two hands to work it, or four hands for twenty-four hours. The single sawmills required one hand each, or two for twenty-four hours. The men who tended the gang carried out of the mill the slabs cut by the slabbing mill and their own slabs and boards. The largest and the best logs were mostly sawed by the new mill, and the smaller and knotty logs chiefly by the gang mill.

The mills cut with great power. The cranks, except those of the gang, were seventeen or eighteen inches. There was an abundance of water, winter and summer; and there were large throats to the water wheels. The saws were thick and seven feet long, with large teeth, and would bear heavy feed. The boards sawed in the single mills looked rough, as the saws cut from one-half to three-quarter inches at the stroke, and made coarse sawdust. The gang saws had finer teeth, cut more slowly, and made finer sawdust, leaving the boards smooth even from knotty logs. Gang boards were sometimes used without planing. The quantity of sawdust shoved into the outlet from these mills in a year was enormous. The mill ponds below, the willow bars, eddies, etc., received these deposits; and the accumulation of years is still to be seen along the outlet, in bends and other places. The water has sensibly diminished in the outlet and will probably continue to grow less. The lumbering business was hard work, from the time the ax was struck into the tree until the boards arrived in market and were drawn out of the water. Of the eight or ten men employed in these mills in 1815, and some of them earlier, Nicolas Dolloff, Jesse Smith, William Clark and myself still survive (1858) and reside in this county. We were then in the prime of life and all temperate. We probably cut as many boards on these mills as any other set of hands did in the same length of time, and perhaps more.

Most of the logs were sawed for the owners on shares, they taking one-half of the boards. The logs were drawn to the outlet, or lake, or pond and floated to the mill. Each owner distinguished his logs by a mark. Marks were rudely made by a certain number of notches on the end or side of the log, or by one or more letters cut on the side, or by letters on the head of an ax, or on a hammer and struck on the end of the log. The sawyers entered the marks on a slate hanging in the mill and the quantity of boards made from each log; and these slate accounts were transferred to the mill owner's books, who was thus enabled to settle with his customers. Rotten or shaky, unmerchantable boards were entered as "rot" and charged to the owner of the logs, and they were piled by themselves. The mill owner could not saw rotten boards for one-half. Next to the slabs were usually one or two wany or bark-edged or sappy boards, which were called "ruffage" (refuse) boards. These were piled by themselves. The rot, or shaky boards, were worth from one-third to one-half the price of the good. They were not all rotten that were so called, but had ring rot stripes of a spongy appearance, and were used by many for log-house chamber floors, or for barns, or sheds. No one intended to draw to mill logs that would make rotten boards, for even sound logs were very cheap. If on being sawed open a log was found really rotten, it was shoved out of the mill to the slab pile and burned. The logs were all drawn up into the mill from the pond on an inclined plane; the water power turning what was called the "bull wheel" with a windlass shaft, which wound up a large chain, one end of which was fastened to the shaft, the other to the log by a dog of hook-like form, driven into one side of the log near the small end of the log.

Nicholas Dolloff and Jesse Smith and myself the rest of the year tended the new mill in 1815, William Clark and others the slabbing mill, and John Fent and others the gang mill. In the new mill we were paid for sawing, $1 per thousand, and boarded. The files were furnished by the owner of the mill, but the saws were filed by ourselves. We usually cut about 2,000 feet in each turn of twelve hours. The hands of the gang

and slabbing mills were paid about $15 per month, and boarded. The logs were cut in the woods almost uniformly twelve feet four inches, or sixteen feet four inches long except butt logs, which were cut longer, as the shaky butts were to be sawed off. Besides boards, most of the scantling and other building lumber was sawed in the new mill. Boards were sawed thin for lathing. All lath used in those early times were thin boards, which were split or cracked with the ax or a hatchet and while being nailed on the studs stretched or spread sufficiently to open cracks for the mortar instead of being sawed into strips as now.

Boards for rafting down the river were put in piles from ten to twenty feet high, and from twelve to sixteen feet square, each layer of boards placed edge to edge and across the layer preceding it. The slab butts and edgings of boards were carried outside of the mills and board piles, and thrown into a common pile to be burned and which was kept constantly burning, winter and summer. Thus millions of slabs were burned to get rid of them, and the burning did not entirely cease until about 1835 or 1840, although the best of them were cut into lath or were used for other purposes much earlier. Pine was here, in early days, almost the only timber sawed; although some cherry, oak and other timber was sawed for customers for home consumption, not much having been sent down the river. Hemlock was hardly deemed worth sawing. Some cucumber, maple and whitewood were sawed into scantling for bedsteads and other uses.

The first or butt log of a tree was not then squared in the woods, but left in the form it had been when chopped down. It must, of course, be squared before it could be sawed. A single sawmill had a "butt-saw" attached to the saw-gate which drew and shoved the saw across the log with each ascending and descending motion of the gate. The refuse piece, or butt sawed off, was called a "butting block" and carried out to the slabs and burned. Thus vast quantities of pine were burned to get rid of it, which would now be highly prized. Mill owners afterwards required all logs to be squared at the butt before they were brought to the mills, and butting saws came into disuse. After a while, mill owners purchased logs by the hundred instead of sawing on shares, even when paid for in boards. The prices of logs varied according to the prices of boards. When logs were thus purchased they were measured across the small end with a rule, and the measurements were set down in a column, which, when added up, showed the total contents of the logs. A log was called or estimated at 200 feet of boards; and when one bought or sold a hundred logs, they were estimated in this way. There were rules or tables for logs of all sizes, whether twelve or sixteen feet long. Hence an average log was called 200 feet. The refuse boards were usually sold by count at about one cent apiece, and many of them were used for rough cheap fences. Most of the village lots were fenced with these boards sustained by stakes and withes, sometimes by nails on posts. They were sometimes used for sheathing for barns and houses (culling out the best) for shingling upon.

No effort has been made to preserve or renew the forests of western New York, and the streams have shrunk to mere creeks or dry beds of sand and gravel in the summer. The Allegheny, that once was large enough at Olean to promise navigation, is transformed in summer to a stream of small dimensions and is a valueless water course for the present generation. When the many waste places of the surrounding hills and valleys shall again become the beautiful forests that once were so conspicuous, the streams will again assume the volume that then filled their courses and the rainfall of wet seasons will remain in the cool embrace of

the forest to feed the innumerable springs that break forth from the rocky cliffs to irrigate the slopes and supply the streams. It is estimated that only one-half of the vast region that constitutes the Allegheny watershed in southern New York is used or needed for agriculture. The remainder is now chiefly a waste of hill and valley, partly grown over with brush and briars, though in many places showing a valuable second growth and giving evidence of what might be the reafforestation were the skill of the forester applied to the region.

It is said that comparisons are odious, but the following table has been compiled for the purpose of showing the decadence of the lumber industry in the central and western parts of New York. According to the State census of 1865 there were 2,417 lumber mills in operation in this part of the State in 1864, with a combined invested capital of $5,399,346. By 1906 it was estimated that this number had dwindled to 373 sawmills in operation. By counties this comparative sawmill statement is as follows:

Counties.	Number of sawmills in 1864.	Estimated number of sawmills in 1906.	Counties.	Number of sawmills in 1864.	Estimated number of sawmills in 1906.
Allegany	79	22	Oneida	167	20
Broome	109	20	Onondaga	71	9
Cattaraugus	143	41	Ontario	34	9
Cayuga	65	5	Orleans	24	1
Chautauqua	125	43	Oswego	201	17
Chemung	57	4	Otsego	140	24
Chenango	105	26	Schuyler	41	3
Cortland	61	12	Seneca	23	6
Delaware	189	22	Steuben	152	22
Erie	119	16	Tioga	93	9
Genesee	33	2	Tompkins	62	11
Livingston	26	5	Wayne	59	7
Madison	93	...	Wyoming	50	11
Monroe	34	5	Yates	29	...
Niagara	33	1			
			Total	2,417	373

CHAPTER XXVI.

NEW YORK—BUFFALO AND THE TONAWANDAS.

Buffalo's lumber history is almost identical with that of her sister city of Albany, chronologically considered. Like Albany, Buffalo's trade was largely due to the opening of the Erie Canal, then known as the Grand Canal, in 1825—for that event made it a gateway for the entrance of lumber into the Empire State; but, like Albany, Buffalo did not assume much importance as a lumber distributing center until after 1850. Here the identity ends; for, while Albany's glory has been slowly fading for years, that of Buffalo has been increasing in luster until today that city stands, next to New York, at the head, as a general lumber market, of all the cities of the great State of New York, and among the first of the United States. As a wholesaler of white pine Buffalo is surpassed by her near neighbors the Tonawandas because of the commanding position of the latter from a shipping standpoint; but, lacking a local trade of importance, and handling a less varied line of lumber products, they do not, as a general market, equal Buffalo. The relative importance of the two centers, in the wholesale trade, is indicated by the canal shipments during 1906, when Buffalo forwarded 146,756 tons, valued at $2,641,615, while the Tonawandas forwarded 233,957 tons. According to the report of the Chamber of Commerce of Buffalo the canal shipments from that city were 88,053,832 feet during 1906. This estimated number of feet of the above given tonnage would indicate a weight of about three and a half pounds to the foot, board measure, suggesting that a considerable proportion of hardwood was included in the shipments. A similar basis for Tonawanda would make its shipments, during 1906 over 125,000,000 feet, but the shipments from Tonawanda, with its greater proportion of white pine, do not have so high an average weight, as is shown by the fact that its shipments were actually 140,362,000 feet, or about three and one-third pounds to the foot.

From about 1853 Buffalo was the point where the cargoes of lumber arriving from southern Ontario and Michigan were transferred to canal boats and forwarded to Albany. Thereafter for some years it was chiefly a forwarding market, and those engaged in the trade there, except the local dealers, were measurers and forwarders of lumber. With the exhaustion of the pine timber growth of western New York State and southern Ontario, Buffalo became in itself a wholesale assorting and distributing

market, leaving the forwarded business largely to the Tonawandas, which later took preëminence in pine wholesaling also.

To a Buffalo lumberman is given the credit for inventing and inaugurating the tow barge system on the Great Lakes, and it was in bringing lumber from the producing country of Michigan to Buffalo that that system was first used.

It is not as a white pine market alone that Buffalo has won her distinction: as a hardwood distributing center that city is one of the chief of the United States. From small beginnings during the last two decades this business has risen to distinction. In 1906 the hardwood lumber handled by the yards of the city aggregated more than 150,000,000 feet, and in Tonawanda approximately 50,000,000 feet was handled. However, this does not represent one-half of the actual hardwood interests of Buffalo dealers, the majority of whom are concerned, either directly or indirectly, in lumber plants in the South or West, a large proportion of whose output is shipped direct from the mills to the trade, not being handled at all at Buffalo.

EARLY HISTORY OF THE CANAL TRADE.

It is to be regretted that the East has kept no permanent comprehensive records of its achievements in the lumber trade nor preserved figures that would show conclusively its volume or direction. For the following information regarding the history of Buffalo's early lumber trade indebtedness is acknowledged to one of the pioneers of the business, Major John S. Noyes, who died in 1906, and who, at the time of his death, had been actively engaged in the trade for fifty-five years. He was, at times, the owner of a number of the lake vessels in the lumber trade.

In 1851, the time when Major Noyes went into the business, practically all of the white pine lumber went to Buffalo from the Canadian shore of Lake Erie in all sorts of small sailing craft, carrying not more than 50,000 to 80,000 feet. Buffalo was at that time quite as much a transfer point for lumber as it is now, for, being the western terminus of the Erie Canal, these cargoes often went into canal boats direct and proceeded east without much interruption. Buffalo then was a small town and did not need much lumber beyond what was produced locally. At that time the pioneer firm of E. & B. Holmes, at first located at Lancaster, fifteen miles east of Buffalo, was handling hemlock in quantity, conveying it in by ox teams. This firm first built a mill on lower Chicago Street in Buffalo, which was gradually enlarged into the present woodworking machinery factory of the corporate company of that name, probably the oldest continuous business in the lumber trade in the vicinity.

SOURCES OF SUPPLY.

At that time hardwood lumber came from the south shore of Lake

Erie in about the same way pine came from the north shore, except that much of the former was in the log. A good portion of it was black walnut, besides ash and other hardwoods. It seems to have been an odd way of shipping lumber, but it doubtless indicated that the country about Sandusky, then one of the best known Ohio ports on account of its harbor, was deficient in sawmills. Major Noyes built a derrick at Buffalo for the handling of these logs, many of them also going on board canal boats for points farther east. Some of this hardwood lumber came originally from Indiana, and it was not until some time afterward that it came down the lakes from as far north as Michigan.

The white pine lumber from Canada came from all along the Lake Erie shore and the traffic served to build up a long list of lake ports which remain fairly good ports for minor traffic. Most of these ports began to decline in importance as soon as the lumber was gone. A few continued awhile for the cooperage trade, but that is worked out and the north shore port is now often nothing but a breakwater, a few buildings and a waste of sand, though a few have been revived of late by the cross-lake coal trade or on account of some local advantage well developed.

It is estimated that the lake lumber trade of Buffalo in the early '50's could not have been much more than 100,000,000 feet annually, and it may have been less than that. There were, however, a considerable number of lumbermen engaged in the local trade at that time, among them being Selim Sears, Seth Clark, Joseph Van Vleck, Oliver Bugbee and Harvey Mixer, a hardwood dealer. Of the old lumber craft there were the scow *Woodman* and the schooners *Flying Dutchman* and *Pine.* Major Noyes owned both those schooners during part of their service. Then a diversion in the trade was created by the building, at Port Dover, on the Canadian side, of the schooner *John Wheeler*, which carried 125,000 feet and created a great stampede in vessel property. She remained the biggest carrier for most of the period from 1855 to 1860.

TRANSPORTATION BY RAFT.

It was about 1858 before the fleet made its way up as far as Lake Huron, but, when it had, the Saginaw ports—Saginaw, East Saginaw, Zilwaukee, Bay City, West Bay City and others—soon became leaders in the water traffic. Only white pine was handled, as hardwoods were left for a later date, and they were not very prominent factors in the timber supply of that district. Not long afterward the question of freight rates became of especial interest. The rate had been very high, going up to $9 a thousand sometimes, so that some device had to be adopted to reduce it. Some one thought of the raft and one was made up and sent down to Buffalo containing nearly 3,000,000 feet of lumber. Some of it was lost on the way and this method of transportation was not tried again for sawed

lumber, though log rafts became numerous and continued to be brought down in quantity until well into the '80's, and a few until close to the end of the century. By that time, however, the Buffalo sawmills were gone, but there were some at Tonawanda and the logs also were taken down the canal.

The rafts were immense affairs and so interfered with the movement of vessels in narrow passages that there was a general feeling of satisfaction when they disappeared. The usage was to lodge them behind the breakwater at Buffalo and divide them up so that they could be managed in the strong current of Niagara River and then to tow them to Tonawanda. It took a long time to bring a raft down from Lake Huron and often a storm would drive one ashore, where the logs were driven so full of gravel that it was difficult to saw them. The last regular sawmill at Tonawanda disappeared about 1895, and the rafts that came down after that were mostly of small logs to be sent down the canal or to be used for piling. Now and then small quantities of logs still come from the Welland Canal through the Chippewa, or Welland, River to Niagara Falls, thence up the Niagara to Tonawanda, whence they are sent down the canal.

THE SCHOONER TRADE.

It was low freights as well as the disappearance of suitable and available timber that did away with the rafts. Some time after the device of the sawed lumber raft was tried the schooners began to multiply until they temporarily reduced the rate of freight sometimes as low as $1.25 a thousand. This was about 1865. At that period the lakes fairly swarmed with small sailing vessels. The idea prevailed that it would be impossible to make larger craft pay, and, besides, the depth of the water, both in the harbors and in the interlake passages, was such that nothing drawing more than twelve feet was able to do business.

It was close to 1860 before lumber began to come down from the Saginaw ports and it was still later when the traffic proceeded farther up the shores of Lake Huron. At one time Buffalo annually received over 400,000,000 feet of lumber by lake, and Tonawanda as much as 700,000,000 feet, though they do not now receive much more than one-half that amount, despite the extension of sources of supply to include the most remote producing points on the Great Lakes.

The cargoes coming down to lower lake ports are usually large in size these later days, often running above 1,000,000 feet. Much of the craft, especially at Tonawanda, is owned by the lumbermen. The fleet is so large that profits are small.

THE STATUS OF THE PRESENT TRADE.

The pine distributing yards at Buffalo in 1907 number about a dozen, and annually handle approximately 200,000,000 feet. These yards are

scattered in various parts of the city, Buffalo having no distinct lumber district such as Albany has. Some are on the Ohio basin, others at the "Tift Farm," others on the Erie basin and still others at Black Rock.

About a dozen concerns constitute the totality of the hardwood handling trade, also, and they rank among the highest in the country in both character and financial strength. The hardwood yards of Buffalo are remarkably well equipped for securing the full variety of hardwoods that grow within the confines of this country, and are situated at a point that is geographically convenient for the distribution of such woods to a large field of consumption. Every known line of American hardwoods is there handled in quantity. The West and Southwest contribute red oak and white oak, chestnut, poplar and cypress; the middle West is scoured for white oak; the Northwest for maple, basswood and ash; from Canada is secured both ash and maple; the Adirondack forest of New York State contributes its quota of maple, birch and cherry, while no inconsiderable quantity of these same woods is secured from Pennsylvania. A recent development is the importation of spruce from the eastern provinces of Canada, coming by water up the St. Lawrence and through Lake Ontario and the Welland Canal.

Some dealers in the Buffalo market make a specialty of one kind of hardwoods, while other dealers are specialists in sundry kinds. It is one of the best known and foremost oak markets in the United States, and probably, in the item of cherry, more high class wood can be found in Buffalo than in any other point in the country.

INDIVIDUAL DEALERS, PAST AND PRESENT.

The oldest available list of the lumber dealers of Buffalo is the roster of those who were doing business in 1874. In that year there were forty-three firms and individuals in the city handling quantities of pine, hemlock and hardwoods aggregating about 303,000,000 feet. Of this quantity 244,000,000 feet was pine, 48,000,000 feet was hemlock and 11,000,000 feet was hardwoods. The business of the forty-three firms was divided as follows: Nine handled white pine; one, hardwoods; four dealt in all kinds of lumber; eleven had planing mills; two, yards; four, planing mills and yards both; one had saw and shingle mills, and the line of eleven others was not designated.

The firms doing the largest business that year were Mixer & Smith, who handled 69,000,000 feet, mostly Michigan pine; Noyes & Reed, 35,000,000 feet; Oline Rinehart & Co., 15,000,000 feet; Evans & Co., 15,000,000 feet, mostly Michigan pine, and George M. Cole, 10,000,000 feet, Michigan pine. The other firms handled amounts varying from 1,000,000 to 7,500,000 feet each. Of the forty-three firms doing business in 1874 but one still retains its original name in 1907. This is Taylor & Crate.

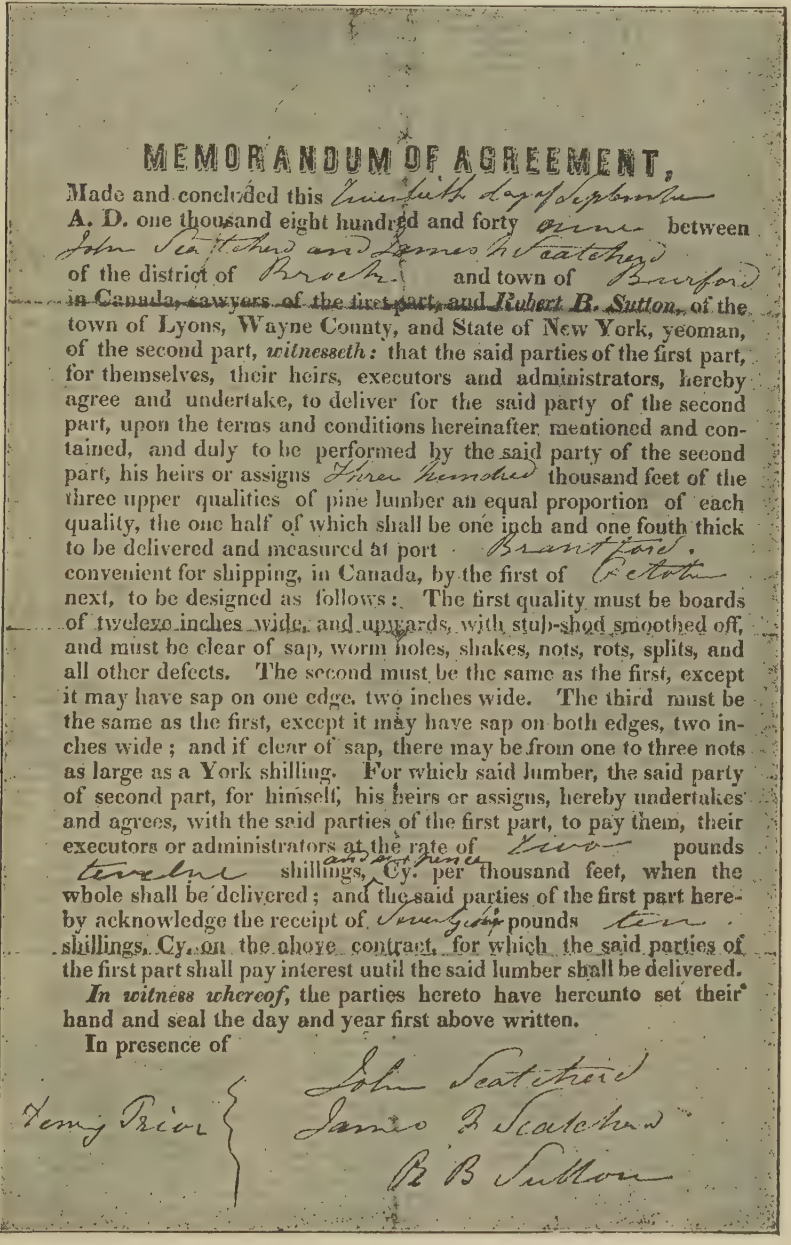
There are seven others that are still doing business and retain at least one of the names of the original members of the firm or corporation, in some cases new partners having been taken in and in others descendents of the original members now continuing the business. These seven firms were known in 1874 as follows: Mixer & Smith, Boller & Reckenwalt, I. S. Newton, George Zimmerman & Co., Joseph Churchyard, Clark, Holland & Co. and Scatcherd & Belton.

In 1907 there were 132 lumber concerns in Buffalo, including wholesalers, retailers, manufacturers, commission dealers, manufacturers of boxes, sash, doors, blinds, interior finish, flooring, etc. Among the prominent concerns in 1907 were the following: Charles M. Betts & Co.; Charles Boller & Sons Company; Buffalo Box Factory; Buffalo Hardwood Lumber Company; Buffalo Maple Flooring Company; Dohn, Fischer & Beyer; G. Elias & Bro.; Empire Lumber Company; Haines Lumber Company; Alfred G. Hauenstein; Holland, Graves, Manbert & George; Hurd Bros., Inc.; The R. Laidlaw Lumber Company; Hugh McLean Lumber Company; McNeil Lumber Company; Mixer & Co.; Montgomery Bros. & Co.; Montreal River Lumber Company; W. W. Reilly & Bro.; Scatcherd & Son; Standard Hardwood Lumber Company; Taylor & Crate, Inc.; Wheeler, Holden Company; Wood-Mosaic Flooring Company; O. E. Yeager, and George M. Zimmerman. The following are prominent concerns having operations elsewhere but maintaining head offices in Buffalo: Empire Lumber Company; Emporium Lumber Company; Goodyear Lumber Company; Great Southern Lumber Company (an outgrowth of the Goodyear business); Holland & Graves (having large mills at Byng Inlet, Ontario); McLean Hardwood Lumber Company; McLean Lumber Company; John L. Roper Lumber Company, and Tindle & Jackson.

AN OLD DOCUMENT.

In this connection it may be interesting to present a reproduction of a memorandum of agreement from the records of an old Buffalo house, because it reflects conditions prevailing in the lumber trade nearly sixty years ago, and because one of the parties to it was one of the most prominent lumbermen of Buffalo of the past generation. This was John Scatcherd, who was, in 1849, a resident of the district of Brock in the town of Burford, Ontario, lying about half way between London and Hamilton. This fugitive bit of concrete history may perhaps find its place here as well as anywhere in this work. The quaint terms and peculiar conditions of the document as well as the details of spelling, etc., will be noted. The terms "sawyers of the first part" and "Yeoman" have passed into antiquity along with the "York" shilling which was to be the standard of measurement of such "nots" as may appear. Neither do Canadians now figure their transactions in pounds, shillings and pence. Reduced to present

currency standards the price is found to be about $12.75 a thousand feet for lumber of a quality which, today, it is difficult to procure and which commands a price at least six times as great.



MEMORANDUM OF AGREEMENT,

Made and concluded this twenty-sixth day of September A. D. one thousand eight hundred and forty one between John Scatcherd and James B. Scatcherd of the district of Brock and town of Burford in Canada, lawyers of the first part, and Robert B. Sutton, of the town of Lyons, Wayne County, and State of New York, yeoman, of the second part, *witnesseth:* that the said parties of the first part, for themselves, their heirs, executors and administrators, hereby agree and undertake, to deliver for the said party of the second part, upon the terms and conditions hereinafter mentioned and contained, and duly to be performed by the said party of the second part, his heirs or assigns three hundred thousand feet of the three upper qualities of pine lumber an equal proportion of each quality, the one half of which shall be one inch and one fouth thick to be delivered and measured at port Brantford, convenient for shipping, in Canada, by the first of October next, to be designed as follows: The first quality must be boards of twelve inches wide, and upwards, with stub-shod smoothed off, and must be clear of sap, worm holes, shakes, nots, rots, splits, and all other defects. The second must be the same as the first, except it may have sap on one edge, two inches wide. The third must be the same as the first, except it may have sap on both edges, two inches wide; and if clear of sap, there may be from one to three nots as large as a York shilling. For which said lumber, the said party of second part, for himself, his heirs or assigns, hereby undertakes and agrees, with the said parties of the first part, to pay them, their executors or administrators at the rate of two pounds ten shillings, Cy. per thousand feet, when the whole shall be delivered; and the said parties of the first part hereby acknowledge the receipt of seventy pounds ten shillings, Cy. on the above contract, for which the said parties of the first part shall pay interest until the said lumber shall be delivered.

In witness whereof, the parties hereto have hereunto set their hand and seal the day and year first above written.

In presence of

Henry Price

John Scatcherd

James B. Scatcherd

R B Sutton

There have been ups and downs in the white pine trade, but for many years the approaching exhaustion of the supply of white pine timber and the actual reduction of the supply to such an extent as to make necessary the substitution of other woods have led to an almost constant increase from decade to decade, practically from year to year, in the prices of the white pine product. Oldtime prices present a marked contrast when compared with those of the present. For instance, in Dansville, near the Canaseraga Creek (a branch of the Genesee River), in Livingston County, a little over a century ago good pine lumber could be bought at the mills for $2.50 a thousand and paid for in almost any kind of barter. After the Erie Canal was opened, in 1825, and was in use from Albany to Buffalo, pine lumber was sold in the city of Rochester for only $6, $8 and $10 a thousand. The idea that lumber ever would be manufactured in a more western locality and transported to that region after the exhaustion of the then supply of timber does not seem to have entered the public mind, or even a thought of the possibility of the exhaustion of the local supply.

A Buffalo price list taken from the *Lumberman's Gazette* (which was absorbed by *The Timberman* in 1887) of July 6, 1876, here is compared with a present day price list, pine being quoted unless otherwise noted. The list is as follows:

WHOLESALE PRICES AT BUFFALO.

July, 1876, Michigan Inspection.		April, 1907, f. o. b. Buffalo.	
Three uppers	$34.00 @ $36.00	First and seconds	$90.00
		Selects	80.00
Common	13.50 @ 15.00		45.00
Culls	8.00 @ 9.00		23.00
Shingles XXX	3.40 @ 3.55	(Pine)	$4.00 @ 4.50
Shingles, clear butts	2.20 @ 2.25		3.00 @ 3.50
Lath	1.90	(Hemlock)	4.75
		(No. 1 Pine)	5.50

DEALERS' QUOTATIONS.

Pine, 3 uppers, yard sorting, 1 in.	39.00 @ 41.00	First and seconds	90.00
		Selects	80.00
1¼, 1½ and 2 in	41.00 @ 42.00	First and seconds	90.00
		Selects	80.00
2½ in. and thicker	43.00 @ 45.00	First and seconds	97.00
		Selects	92.00
Pickings, 1 in.	29.00 @ 31.00		80.00
Pickings, 1¼ in. and thicker	30.00 @ 32.00		80.00
Shelving boards and choice stocks	16.00 @ 17.00	(Average)	40.00
Common (sidings)	14.00 @ 15.00	No. 2 Barn	33.00
Culls	11.00 @ 13.00	(Box)	26.00
Hemlock, 12 to 18 ft. in length, 1 to 3 in.	12.00 @ 13.00	(Average)	21.00
Hemlock joists to 20 ft. in length	13.00 @ 14.00	20 ft.	21.50
Hemlock timber and plank, 20 to 45 ft.	14.50 @ 17.50	(Average)	24.00
Pine shingles, clear butts	2.50 @ 2.75		3.00 @ 3.50
Pine shingles, XXX	3.75 @ 4.00		4.00 @ 4.50
Lath	2.25		4.75 @ 5.50

One of the old Buffalo wholesale houses has compiled a table showing the selling prices of white pine lumber at its yard in Buffalo since 1862, a period of forty-five years. These figures were compiled from sales shown on the books of Haines & Co. and their successor, the Haines Lumber Company, and, therefore, represent actual transactions. They are as follows:

SELLING PRICES OF WHITE PINE LUMBER AT BUFFALO.

	4-4 Uppers.	4-4 Culls.
1862—July	$18.00	$ 7.50
1863—January	19.00	8.50
July	25.00	11.00
1864—January	30.00	13.00
July	30.00	15.00
1865—January	38.00	16.00
July	28.00	11.00
1866—January	30.00	12.50
July	45.00	14.00
1867—January	45.00	14.00
July	45.00	14.00
1868—January	45.00	14.00
July	45.00	14.00
1869—January	45.00	14.00
July	45.00	14.00
1870—January	45.00	14.00
July	43.00	13.00
1871—January	40.00	13.00
July	42.00	13.00
1872—January	50.00	16.00
July	50.00	16.00
1873—January	50.00	17.00
July	46.00	12.50
1874—January	44.00	12.50
July	44.00	11.00
1875—January	42.00	10.00
July	40.00	9.00
1876—January	37.00	9.00
July	37.00	9.00
1877—January	37.00	9.00
July	33.00	9.00
1878—January	30.00	9.50
July	28.00	10.00
1879—January	28.00	10.00
July	28.00	9.00
1880—January	36.00	12.00
July	42.00	12.00
1881—January	45.00	12.00
July	44.00	12.00
1882—January	46.00	13.00
July	47.00	13.00
1883—January	47.00	13.00
July	47.00	13.00
1884—January	48.00	13.00
July	46.00	12.00
1885—January	46.00	12.00
July	$45.00	$11.50
1886—January	45.00	11.00
July	45.00	11.50
1887—January	45.00	12.00
July	45.00	12.00
1888—January	45.00	13.00
July	44.00	12.50
1889—January	43.00	12.50
July	43.00	12.50
1890—January	44.00	12.50
July	43.00	12.50
1891—January	43.00	12.50
July	43.00	12.00
1892—January	44.00	12.00
July	46.00	12.50
1893—January	48.00	13.00
July	48.00	13.50
1894—January	47.00	13.50
July	45.00	13.00
1895—January	45.00	12.00
July	45.00	11.00
1896—January	44.00	11.00
July	44.00	11.00
1897—January	45.00	11.00
July	45.00	10.00
1898—January	45.00	10.00
July	45.00	11.00
1899—January	46.00	12.00
July	51.00	14.00
1900—January	57.50	19.00
July	57.50	17.00
1901—January	58.00	16.50
July	60.00	16.50
1902—January	68.00	16.00
July	73.00	16.00
1903—January	80.00	16.50
July	82.00	17.00
1904—January	82.00	18.00
July	80.00	18.00
1905—January	82.00	18.50
July	82.00	19.50
1906—January	82.00	21.00
July	85.00	24.00
1907—January	90.00	27.00
July	90.00	28.00

During the period covered by the table such changes occurred that the comparison, after all, is not complete, but inch uppers and culls were considered by the compiler as representing relative prices most fairly and continuously. There have been great changes in quality. Uppers have perhaps changed the least of any grade, yet, owing to the present scarcity of really fine logs, uppers in 1862 ran much wider and with a larger percentage of absolutely clear than today. Culls forty years ago contained much lumber that today is assorted into higher grades and much stock is now admitted in culls that then would have been considered practically worthless. It is probable that the culls of 1862 would be worth today in the Buffalo market from $30 to $35 a thousand, while the culls of today would have been mill culls at the beginning of the period.

CHANGES IN GRADES.

In 1862 practically only three grades were recognized—uppers, common and culls. Today there are twenty or more grades, besides subdivisions of the grades according to widths and lengths, to which different prices

are attached. The development of this finer grading has encroached upon the old cull grade, but not upon uppers, which, on the contrary, have been tending toward deterioration.

The lessened quantity of timber available and its consequently higher price, the multiplication of grades, and changes purely from the consuming side, together with variations in the tariff, have all combined to bring about the changes in prices noted in the table.

The effect of measuring values in the depreciated currency of the '60's and early '70's is plainly shown. The price advanced after 1862 by leaps. Two influences were at work up to 1866—the depreciation of the currency and the greater cost of manufacture owing to war conditions. The war was a wonderful stimulus and it will be noted that from July, 1866, to January, 1870, a uniform price both in uppers and culls was maintained—higher, with some unimportant exceptions, than for more than ten years thereafter.

As late as 1879 the price of uppers was $28, and of culls, $9. Up to that time there had been no realization of the fact that the white pine lumber supply ever could be exhausted. The forest seemed illimitable, but the census of 1880, while it was grossly inaccurate as to the amount of standing timber, caused people to think about the subject and to take closer stock of the quantities then in individual hands and of the public timber still available, with the result that prices at once began to stiffen. This price advance was augmented by the rapid development of the West, which required immense quantities of building material that could be supplied only from the forests of Michigan, Wisconsin and Minnesota.

As the boom times of the early '80's died away there was some weakening in prices, but it was not important. Then came 1892 and the first part of 1893, with their high prices, and then the collapse following the panic of 1893. It will be noted that lumber prices did not seriously decline. The highest figures made in the history of the trade up to 1899 were in 1872, but it will be found that, if the figures of the '60's and early '70's were reduced to a gold basis, the prices obtaining even during the periods of the last decade were higher than then. Following the depression of the middle '90's, beginning after 1896 came another swelling movement in white pine values. Then prices went up to before unheard of figures. There they remain.

INFLUENCE OF THE TARIFFS.

There are two epochal points in the table that are worthy of special attention, one in 1881 and the other in 1899. Each marked flood tides in the development and prosperity of the nation. Other influences were, of course, at work, whose effects were not so immediately apparent. The tariff had something to do with the variations, and yet the institution of

neither the Morrill, the Wilson-Gorman, the McKinley, nor the Dingley tariff was especially marked by prompt changes in prices, although their advocates might consider the adoption of the McKinley and Dingley tariffs responsible for the introduction of new eras of industrial and commercial expansion, which were later reflected in prices of all commodities. Yet the change of duty had something to do with lumber prices. It is to be noted that the abolition of the lumber duty in Cleveland's second administration was followed by an immediate reduction of $2 in the price of uppers, and of a less amount in the price of culls, with prices sagging thereafter for three years. On the other hand, the effect of the Dingley tariff, of July, 1897, was anticipated by the first of that year on uppers, while the heavy importation of culls prior to its taking effect actually reduced their price for a time. The full effect of the tariff was not wholly realized for a year and a half after it was applied.

The increase in values of lumber from 1862 to 1873 was due to inflated currency, the enlarged demand and greater business activity following the war. The advance which took place from 1880 to 1893 was due to growth in population and to rapid industrial and commercial development. The advance which began in 1899 and which has continued to this day has been due to industrial prosperity in part, but chiefly to diminution of the supply of white pine to a point where its end is actually in sight, though the eye of the prophet is not aided by any theodolite which will enable him to measure with accuracy the exact point in the vista of years where white pine will cease to be an important commodity.

THE RISE OF THE TONAWANDAS.

In the days when lumber was carried exclusively, or almost so, by sailing vessels, Buffalo was the necessary terminus for shipments from the West, because below that the Niagara River, preparing for its plunge over the limestone cliffs, rapidly increases its current. But when the steamboat and the steam barge, with or without its tow of barges, came into common use, Buffalo ceased to be the necessary terminus of this water route and the Tonawandas came into prominence. The lumber trade originated within the village of Tonawanda, but later was largely transferred to the present city of North Tonawanda. The two places really comprise a single great lumber district, and so closely connected are their interests in this industry that they may be considered as one.

When a town can truthfully claim to be the second largest market in the world for one of nature's great staples, it is entitled to a consideration which mere size can not always command. It is the proud boast of Tonawanda that, individually, excepting Chicago, it is the greatest wholesale white pine market on the globe. Practically the entire stock received at this port is reshipped by rail or canal to other places, in which respect it

differs from Chicago and the city of New York, both of which consume a large proportion of their lumber receipts within their own limits.

The growth of Tonawanda from a swamp-environed, straggling hamlet to a place of the first commercial importance presents one of the phases of American life which is seldom paralleled in any other country. Geographically, it is a commercial center of the great lumber producing section of Wisconsin, Michigan, Canada, New York and Pennsylvania, from which Nature has provided inexhaustible water ways to the Tonawandas, whence the Erie Canal affords artificial connection with tide water.

ADVANTAGES OF LOCATION.

About ten miles below the point where Lake Erie becomes the Niagara River, there flows into the river from the east Tonawanda Creek. At the mouth of this stream, on the south side, is Tonawanda, and opposite, on the north side, is North Tonawanda. They are opposite the center of Grand Island. In the channel of Niagara River, opposite the mouth of Tonawanda Creek, is a small island so located that the main current passes it on the west, while on the east, between the island and North Tonawanda, is formed a natural and quiet harbor.

Here, then, at the Tonawandas and on Tonawanda Island, was room for a bulky commodity like lumber. Land was, and still is, cheap in comparison with that in Buffalo, and ample room for lumber yards could be obtained at a reasonable cost. But this was not all. The Tonawandas have the advantage of the tracks of several of the most important railroads that enter Buffalo, and, by switching arrangements, of all of them. They have the New York Central & Hudson River Railroad, the Erie, the Wabash and the Lehigh Valley. Furthermore, the site of the Tonawandas is where the Erie Canal strikes the Niagara River. From there it closely follows the shore south to Buffalo, but the Tonawandas are the natural and the cheapest location for the transshipment of a bulky commodity like lumber from lake vessels to canal boats; and when the proposed enlargements (mentioned in the chapter on Albany) are completed, so that barges carrying 1,000 or more tons can traverse the canal, the advantages of this location will be accentuated, for the enlargement of transshipment facilities, which will necessarily have to be made by forwarders, will be more cheaply accomplished at the Tonawandas than at Buffalo itself. Even in 1906 Tonawanda shipped by canal 233,937 tons of lumber, against 146,756 tons by Buffalo.

North Tonawanda has about four miles of water front docked and in active use, with as much more yet available. To this is added the splendid frontage of nearly two miles clear around Tonawanda Island, made available by the enterprise of Smith, Fassett & Co., in the '80's. The docks are but four feet above low water level, which is all that is

necessary, as the river is not subject to freshets. The lay of land adjacent to the docks is unsurpassed for all commercial and manufacturing purposes, and is particularly adapted to the lumber business, inasmuch as transportation and the shifting of stock from one point to another is done on practically level ground.

FIRST ATTEMPTS AT MANUFACTURE.

As was mentioned before, the development of the Tonawandas began in an aggressive way when sail was superseded by steam as motive power on the majority of vessels coming down the lake; but before that time some lumber business had been done at that point, and it is a curious fact that the first venture was in the way of manufacture. As early as 1840 a sawmill and planing mill were established by John Simson,[1] who, with others, was instrumental in causing the Cleveland Commercial Company to improve and develop the harbor. That was in 1849. The company built warehouses, docks and elevators similar to those at Buffalo. The growth of the Tonawandas was so rapid that in 1853, four years later, the Niagara River at that point was jammed with steamers and schooners bringing from the West flour, pork, grain and live stock, to be transferred to cars and canal boats and transported to the East. In the meantime, in 1848[2], the first steam sawmill had been erected by Col. Lewis S. Payne; in 1850 Merritt Crandall started another, and soon afterward Simson, Woolson & Whaley built mills.

It may be an interesting digression to follow a little farther the history of the first steam sawmill of the Tonawandas. The following item from the *Tonawanda Herald* appeared in the *Lumberman's Gazette* of July 12, 1877:

> Stillness and quiet now reign supreme in and around the once busy mill of Walrath & Downer, Tonawanda, New York. For about a quarter of a century the "big mill," as it is familiarly known, has been engaged continually in the manufacture of lumber and timber. In its early days it was the property of Colonel Lewis S. Payne—afterwards owned by Mr. Botsford, of Albany, and then by Messrs. Cutler & Ransom, who sold to Walrath & Downer. During all this time the busy hum of its machinery has been heard, and the products of its labor have been scattered all over the eastern states, and some, in fact, reaching the European market. We trust it will soon resume its former activity. Many of our people have noticed upon its brick chimney the letters Z. T. They are the initials of the name of Zachary Taylor, during whose presidency it was built.

Zachary Taylor was inaugurated in 1849, and, therefore, the mill could not have been built prior to that year, if the above quotation is entirely correct; but another writer says: "Colonel Payne was a warm advocate of Zachary Taylor for the presidency. His mill was built during the presidential campaign and he had the initials 'Z. T.' done in colored

[1] "History of Erie County," Truman C. White, 1898.

[2] White's "History of Erie County," to which previous reference has been made, gives this date as 1847; but the evidence regarding the initials "Z. T." in the chimney establishes 1848 as the correct year.

bricks in the tall chimney." Such a precise statement is satisfactory evidence that the date 1848 is correct.

THE INCREASE OF THE INDUSTRY.

The first cargo of lumber was shipped to Tonawanda from Canada in 1857 by Bronson & Co. About that time, or a few years later, B. F. Betts interested himself in the lumber trade. In 1859 the elevator burned and Tonawanda entered upon a new era of hard times. Then the stave business came to the rescue and for a time Betts & Co. and their successors, J. A. McDougall & Co., received considerable quantities of material for manufacture at their stave mill. The stave business decreased in 1860. William Emerson provided Tonawanda with a new industry in the shape of planing mills. He was a pioneer operator, and numerous sash, door and blind factories have been built as a result of his example. His early planing mill passed to Homer & Daniels and from them to George E. Hill. In 1865 A. B. Williams and A. G. Kent bought the mill of Merritt Crandall, and, later, those of Frederick Smith and Robert Koch; Mr. Williams continued in the business for many years.

By the year 1865 Tonawanda began to be an important lumber center, though it did not assume remarkable activity in this respect until after 1870. The lumber trade continued to increase until 1890, in which year it attained its maximum.

Perhaps the man to whom the Tonawandas are most indebted for their prominence in the lumber trade is H. P. Smith, who conceived the idea of rafting logs from Canada and the Northwest to Tonawanda for manufacture. This was in the early '60's. The experiment was successful. A supply of logs being insured, sawmills sprang into being, and for many years their product was sent through the Erie Canal to Albany and other eastern New York cities. This towing of logs undoubtedly fixed the attention of the men who thereafter became the pioneers of the lumber yard distribution of western lumber, and attracted them to the splendid harbor facilities offered and to the navigable condition of Niagara River. The swift current was against sailing vessels, but as soon as the system of a propeller or steam barge towing several other barges or schooners through the lakes came into use the problem was solved.

THE FIRST OF THE WESTERN TRADE.

Previous to 1866 no cargoes of lumber had been shipped directly from the West to the Tonawandas. At that time the firm of Betts & Ayer (composed of B. F. Betts and Edward T. Ayer) had possession of the dock known as the distillery dock, then the only river dock in North Tonawanda. In September, 1866, James Tillinghast, then assistant superintendent of the western division of the New York Central & Hudson River Railroad, informed Betts & Ayer that he had a carload of lumber

consigned to him at Buffalo, to be shipped over the New York Central, but had no place to put it, as the railroad docks were full, and requested them to receive it at their docks at Tonawanda. In due time the cargo, of about 230,000 feet, arrived and was being unloaded at their dock. They commenced delivering this lumber to the cars by teams, but Mr. Betts proposed running a side track to their dock. Mr. Tillinghast consented to this, and within three days the track was laid, and the cars were loaded directly from the piles of lumber in the yard. This was the first of the network of tracks now laid to the docks in North Tonawanda.

In the spring of 1867 Betts & Ayer began receiving and forwarding lumber for William D. Olmsted, of Leroy, Genesee County, New York. The first load was from Saginaw, Michigan, and contained about 350,000 feet, then considered a large cargo. The freight was fifty cents a thousand feet over Buffalo rates in consequence of the supposed difficulties of navigation in the Niagara River and of getting dispatch in unloading. The captain of the vessel stopped in Buffalo and took on a gang of men who agreed to unload her for $100. Upon arriving at Tonawanda the vessel was unable to get within six feet of the dock. Consequently, the men demanded $25 more. Betts & Ayer were also engaged at this time in getting out a large quantity of wood for the New York Central, and had about seventy men, mostly French-Canadians, at work four miles down the river. Upon being informed of the state of affairs at their dock, they proposed to the captain that they would unload the vessel for $100 and do it with dispatch. The captain accepted their offer, and they put two of their yardmen at fixing a runway from vessel to dock. At this the Buffalo gang drove the men off and would not let them work. A messenger was at once dispatched posthaste to the foreman of the wood gang, with orders to send thirty of his best men (and if they were men who struck from the shoulder it would be no objection). In about an hour the men drove into the yard and reported ready for further orders. At this time the Buffalo gang was sitting around upon the vessel. The captain was directed to send all his men afloat or below decks. At this the Canadians made a rush; the Buffalo men stood not upon the order of their going, but went at once, several going into the river and one being nearly drowned. In three minutes the deck was cleared, and Betts & Ayer had full possession. This was about 10 o'clock a. m., and by night the vessel was unloaded. The captain was informed that thereafter he need not import any men to that port, as Tonawanda was able to furnish her own.

During that season freights went up to $5 and $6 a thousand, and, in a few cases, as high as $7. Mr. Olmsted, rather than pay these rates, conceived the plan of rafting his lumber from Saginaw. His first raft was

said to have been ten feet deep, thirty feet wide and 500 feet long, containing about 1,500,000 feet. It was towed through the lake and landed just below the distillery dock. The lumber in this raft was handled by Betts & Ayer, and the cost of it from Saginaw to delivery in yard was $2.11 a thousand. This firm handled during that year about 5,000,000 feet belonging to different people. The next year it handled about 8,000,000 feet, mostly lumber belonging to William D. Olmsted, of Leroy, and the Sturgeon Bay Lumber Company. About this time, 1870, other parties began to build docks.

PHENOMENAL GROWTH OF THE LUMBER TRADE.

This year, 1870, brings us again into the main path of this brief history of Tonawanda, from which we stepped off into a bypath of individual enterprise, which, however, as is often the case, had a vital influence upon the general lumber business.

By 1870 sawmills had had their day for everything except timber production, sawed lumber had begun coming from western mills, and yards were being established. When in 1871 the receipts of lumber by lake reached 52,000,000 feet, it was thought by Tonawandians of that time to be an enormous business; but in 1872 the amount doubled, and before the decade had closed there began a phenomenal increase in the business, which reached its culmination in 1890, when the enormous quantity of 718,650,900 feet was received at the Tonawandas. Practically all of it was white pine and came from nearly every lumber producing point on the upper lakes, including those in Canada. To this quantity may be added 13,039,600 lath and 52,232,300 shingles. Their combined values—lumber, lath and shingles—indicated a business that year of over $16,000,000. The number of persons employed—yardmen, planing mill hands, stevedores and office men—is estimated at over 3,000, their annual wages exceeding in the aggregate $1,500,000. But during the following decade the shipments declined somewhat from the high water mark of 1890, the receipts in 1900 being reported at 409,728,377 feet. This decrease was due to through shipments from the West of carload lots direct to the retail yards in the eastern states, and to disadvantages in freight rates. Since 1900 the receipts have remained practically the same, decreasing one year to increase the next. But even yet the lumber business at the Tonawandas is immense, employing a great many men, dispensing a large amount of money annually in wages, and, as a distributing point for New England and the middle states, it contributes materially to the commercial supremacy of the State of New York.

The following table shows the receipts of lumber, lath and shingles, by lake, at the Tonawandas, for each year from 1873 to 1906, inclusive, and also the shipments of lumber, by canal, during the same period:

RECEIPTS AND SHIPMENTS AT THE TONAWANDAS—1873–1906.

Year.	Receipts by lake.			Shipments by canal.
	Lumber, feet.	Lath, pieces.	Shingles, pieces.	Lumber, feet.
1873	104,999,000	1,258,000	1,112,000	80,273,285
1874	144,754,000	1,506,000	10,822,500	115,752,111
1875	155,384,805	6,559,200	13,088,509	120,650,792
1876	207,728,227	6,137,770	18,907,500	165,545,742
1877	221,897,007	5,126,000	23,249,200	188,400,335
1878	206,655,122	3,629,300	21,435,500	173,085,467
1879	250,699,043	5,606,400	30,122,000	206,442,542
1880	323,370,814	1,249,600	22,920,000	291,000,000
1881	415,070,913	282,000	24,271,000	328,886,395
1882	433,241,000	419,000	38,312,000	326,800,681
1883	398,871,052	6,031,850	55,817,000	324,528,266
1884	493,268,223	16,367,000	66,285,000	384,455,535
1885	498,631,400	7,652,000	52,004,000	355,230,391
1886	505,425,000	11,883,000	52,825,000	347,932,845
1887	501,237,850	4,096,000	53,435,000	341,925,473
1888	269,522,200	16,617,300	64,903,000	320,149,453
1889	676,017,200	11,506,000	68,712,000	350,220,300
1890	718,650,900	13,039,600	52,232,300	373,569,621
1891	505,512,000	8,209,800	53,561,000	293,211,900
1892	498,005,000	6,342,245	42,809,300	286,329,307
1893	430,249,000	13,232,600	35,257,400	216,116,532
1894	406,538,000	8,495,450	31,478,700	202,110,990
1895	421,372,500	8,547,000	41,310,650	195,886,000
1896	489,675,500	7,186,750	35,822,750	185,580,352
1897	601,376,450	7,528,300	48,501,200	218,576,701
1898	479,066,136	3,501,500	78,674,500	184,709,746
1899	541,576,959	1,679,350	14,491,461	174,294,366
1900	409,728,377	1,795,450	55,764,000	154,175,102
1901	451,596,420	3,394,050	16,821,750	205,838,854
1902	406,922,933	2,318,000	12,969,000	159,721,504
1903	458,555,122	1,216,000	22,438,000	157,377,155
1904	414,806,949	3,340,950	2,340,800	135,011,653
1905	465,139,603	3,533,950	.....	155,364,249
1906	.....	.....	.....	140,362,442

It will be observed in glancing over the above table that the lumber receipts of the Tonawandas have been markedly uniform in the main. There have been some lean years and some fat ones, but on the whole the figures have averaged about 450,000,000 feet a year, and the average does not vary materially now from what it did twenty years ago. When the tremendous decrease in the output of northern pine and the increasing disposition to ship direct from mills to points of consumption by rail are considered, this fact is a remarkable one. While other markets have been declining in their handlings of northern pine Tonawanda has practically held its own, and it is today, undoubtedly, second only to Chicago in its wholesale handling of northern pine, and perhaps surpasses it, for Chicago's receipts are extremely varied in kind and much of its northern pine is sold locally in a retail way, while the consumption of the Tonawandas is comparatively nothing. If the facts could be ascertained with certainty, it would very likely be found that Tonawanda is the greatest wholesale white pine market in the country and in the world.

The canal, the lakes and steam navigation have made the Tonawandas, though the railroads fostered their growth and assisted in their present development; for not only do the dealers handle the product of the white

pine mills along Georgian Bay and on the Lakes and of the hardwood mills tributary to lake traffic, but large quantities of lumber are brought in by rail from all the hardwood districts of the United States and from the interior pine mills of Canada. So, while pine remains the chief commodity, there have been added to the Tonawandas' stocks other elements which go to make it a well rounded market.

It may be asked why the Tonawandas maintained their pine business so near its highest point when most other markets have been falling away. It is, in brief, because of the conservatism of the East and because of the greater remoteness of the yellow pine producing sections from the East than from the central part of the country and the West. All that part of the United States north and east of a line drawn from New York City to Pittsburg and thence to Buffalo is a section of fixed habits and rigid commercial customs. It was originally a white pine country, having enough of that wood in each locality for local requirements, and became so wedded to white pine that no rival could usurp its place. When its own supplies were exhausted, it looked to Canada and to Michigan. Even today white pine is demanded by a considerable proportion of the lumber dealers and woodworkers of all that large and populous region.

In the West white pine was perhaps as highly appreciated but it was not so insistently demanded. A little matter of price would change the fealty of consumer and dealer alike in Ohio, Indiana, Illinois, Iowa and Kansas from white pine to almost any other wood that could be made to serve the purpose. Consequently, when yellow pine began to be made into lumber for northern shipment, it found its most ready acceptance in the West; but in the East lumber dealers and consumers were willing to pay for the privilege of satisfying their whims. Undoubtedly, for ordinary building purposes white pine is the most satisfactory wood that grows in the United States, but its supply is rapidly lessening and other materials are made to take its place, except in the East. There, the majority of buyers are willing to pay for the luxury of satisfying their preference. The result is that the bulk of the best pine product of Michigan, Wisconsin, Minnesota and western Ontario goes to the East, and the great point of transshipment, which is Tonawanda, sees its business maintained in nearly its former proportions. Even long decadent markets like Albany, and Burlington, Vermont, still maintain a pine wholesale business of some importance; and if the man who thinks that white pine is no longer cut and that pine uppers are a reminiscence will go to these points he will open his eyes with astonishment at the magnitude and quality of stocks he will find. They are not gathered together easily in these days, but gathered they are, from a multitude of sources, by rail and water, picked out of the still enormous output of mostly common—very common—lumber.

So it is that the Tonawandas now make up the largest white pine wholesale market in the United States. There are other markets that surpass this great center in total volume of business done or in annual receipts. Boston, New York, Philadelphia, Pittsburg, Buffalo, Chicago, Saint Louis, all surpass it, and perhaps others outrank the Tonawandas in volume of total handling, but their stocks are made up of multitudinous varieties, while that of the Tonawandas is still largely northern pine, and white pine rather than norway. In this respect it is unique.

Still, in the list of lumbermen at the Tonawandas are others than dealers in pine, together with a number of box factories and woodworking establishments. Already this market is beginning to anticipate the time, unless pine is reinforced by other woods, when its business must decline, and so there are extensive hardwood yards and the stocks in most of the yards include larger or smaller quantities of hemlock, hardwoods and even of southern pine and Pacific Coast woods; in fact, the Tonawandas are an eastern concentrating point for western cedar products.

With a business so large and so long established and with the personnel of its trade membership so high, the Tonawandas may be expected to maintain their supremacy as a wholesale point for northern pine so long as the supply of that wood shall last. Until the last tree is cut the East will demand and will be willing to pay for white pine and the Tonawandas will furnish it. But with a lumber business so well established it will not disappear or materially decline with the gradual extinction of white pine. That wood will be in continually increasing quantities replaced by others, as it is beginning to be already. For a generation to come Tonawanda is likely to remain one of the leading wholesale lumber markets of the United States.

PERSONNEL OF THE TRADE.

In preceding pages the names of many of the earlier lumbermen of the Tonawandas have been given, but the earliest complete list available to the historian is dated 1874; but that year is sufficiently remote to emphasize the growth and changes of a third of a century. In November, 1874, the Tonawanda trade numbered fifteen dealers in white pine lumber, handling that year a total of 153,750,000 feet board measure; two shingle dealers; twelve dealers in square timber, round logs and spars, handling 72,500,000 feet, making a total of 226,250,000 feet. The lumber dealers handling the largest amounts were Smith, Fassett & Co., 85,000,000 feet; McGraw & Co., 25,000,000 feet, and J. A. McDougall & Co., 15,000,000 feet. The others handled amounts varying from 500,000 to 8,000,000 feet, and were as follows: J. R. Edwards, handling some oak also; E. H. Rogers, dealing in hardwoods as well as pine; C. Haines; A. G. Kent; H. M. Stocum; J. E. Potts; Vincent, Koch & Co.; James

Jackson; Charlton & Co.; Shell & Watkins; Walrath, Downer & Co., and McBean & Bro. The shingle dealers were J. A. Bliss & Co. and J. Batt. Dealers in square timber, round logs and spars were H. P. Smith & Son, 17,000,000 feet; Misner & McDougall, 15,000,000 feet; Evans & Kilmaster, 10,500,000 feet; J. & T. Charlton; E. Morse & Co.; Bliss & Pierce; C. H. Beemis & Co.; E. H. Rogers; A. Chesbrough; J. & W. Taylor; Arnold Burroughs; Williams, Morse & Welch.

The principal dealers engaged in the lumber business at North Tonawanda in 1907 were as follows: John & Thomas Charlton; The R. T. Jones Lumber Company; Kelsey-Dennis Lumber Company; McLean Bros (Inc.); Robinson Bros. Lumber Company; Silverthorne & Co.; Smith, Fassett & Co.; Thompson, Hubman & Fisher; A. Weston & Son; White, Gratwick & Mitchell (Inc.); White, Frost & White, and William H. White Company, of Boyne, Michigan, having offices only at North Tonawanda. Besides these there were twenty-six other dealers. At Tonawanda in 1907 were A. A. Bellinger; Cornelius Collins; Eastern Lumber Company; P. W. & J. W. Scribner; Tonawanda Post & Shingle Company (Inc.); C. J. Wilk & Co., and Wilson Lumber & Box Company.

CHANGES OF A QUARTER CENTURY.

Changes in the prices of white pine have kept pace with the other changes in the industry, due to the growing scarcity of this once plentiful product and a consequent increase in the value of stumpage, to the increased cost of labor and machinery, to the general prosperity of the country and to the concentration of the remaining large tracts of this timber in the hands of a comparatively few owners, thus reducing competition to a minimum. Advanced freight rates have also been a potent factor in the increased price of white pine at the Tonawandas.

TRADE ORGANIZATION AT TONAWANDA.

So long ago as 1875 the receipts of white pine lumber at Tonawanda had reached such magnitude and gave such promise of growth that the wholesale lumbermen who then felt responsible for the future development of that infant market turned to organization as one of the necessary elements of success. On July 30 of that year the lumber, timber and shingle manufacturers of that town met at the offices of Evans, Kilmaster & Co. and organized the Tonawanda Lumbermen's Association and the necessary committees. The firms represented at the meeting were Cowper & Gregory; J. & X. Batt; Smith, Fassett & Co.; H. M. Stocum; J. A. McDougall & Co.; J. C. Cameron & Co.; Evans, Kilmaster & Co.; A. G. Kent; Walrath & Downer; Beemis & Co.; J. & W. Taylor; McGraw & Co., and J. & T. Charlton.

The purposes of the Association were to advance the interests of the Tonawanda lumber and timber trade and to work for the betterment

of Niagara River navigation and the harbor facilities of the port. Its first officers were as follows: President, Theodore S. Fassett; vice president, Ira S. Bennett; secretary, W. H. Cowper; treasurer, H. M. Stocum. The organization at once became a powerful factor in the phenomenally rapid growth of this great lumber distributing market. Trade or price regulation has never been a part of its mission, but of late years it has been of untold value to the business of the market in successfully regulating and arbitrating the affairs of labor as they have arisen. Its officers in 1907 were as follows: President, Hugh McLean, Junior; vice president, J. P. Mackenzie; secretary and treasurer, Guy White.

With the lapse of years the trade conditions of the Tonawandas and of Buffalo had become so closely allied, freight rates both in and out being the same, that the interests of both markets were and are substantially identical. The late Pendennis White, of White, Gratwick & Mitchell, of North Tonawanda, for two terms president of the National Wholesale Lumber Dealers' Association, an enthusiastic believer in the value of trade organization for the common good, crystallized the idea of joining the white pine wholesalers of Buffalo and the Tonawandas in one organization, and in November, 1903, there was formed the White Pine Association, with headquarters in North Tonawanda. It started with a membership that included nearly all the wholesale dealers in the two markets. Its first officers were as follows: President, Pendennis White, North Tonawanda; vice president, George B. Montgomery, Buffalo; secretary and treasurer, George S. Dailey. The object of this organization was to give its members the benefit of knowledge each month of the amount of each grade in pile on their various yards, thereby facilitating an interchange of trade among each other, and, while giving, from time to time, some consideration to the proper basis of market values, avoiding all illegal combination. Its officers in 1907 were the following: President, C. W. Betts, Buffalo; vice president, L. R. Vandervoort, North Tonawanda; secretary and treasurer, George S. Dailey.

CHAPTER XXVII.

NEW YORK—STATISTICS.

The remarkable way in which a state, that has within its boundaries a considerable area better adapted to tree growing than to agriculture, can maintain its lumber production is exemplified in New York. Unless settlers at Jamestown may have antedated with power mills those on Manhattan Island, New York was the seat of the first sawmill industry on the continent; for, while dates are not absolutely certain and some would claim for the vicinity of Portsmouth, New Hampshire, the seat of the first sawmill operated by power, it seems probable that the first mills were erected by the Dutch settlers at New Amsterdam. From that date, early in the Seventeenth Century, until now New York has been one of the leading producers of lumber among all the American commonwealths. In colonial days it produced lumber not only for its own use but for distribution among consumers on Long Island Sound, and under the National government, in spite of the extension of the lumber business north and south and west, it maintained its supremacy until after 1850 and in 1900 was the eleventh state in value of mill products.

The sawmills on Manhattan Island soon cut out the timber immediately available, although they lasted long enough to give name to Sawmill Creek, which emptied into the East River. From there the industry spread to Staten Island, to Long Island and up the Hudson; only a few years after the first mills were erected at New Amsterdam, Fort Orange, now Albany, becoming another center from which the industry spread up and down the Hudson and up the Mohawk.

By the beginning of the last century the upper Hudson had begun to contribute its logs to the lumber needs of the growing commonwealth. Before the middle of the century every county had been invaded by the sawmill and white pine of native growth was becoming scarce; yet in the '80's—only twenty or twenty-five years ago—comment was caused by the rapid development of pine manufacture in the Adirondacks, just when the lumbermen of Michigan were beginning to talk about a near decline of their industry. Indeed, the Adirondacks long remained an almost inaccessible storehouse of timber; for the lumber trade, like other branches of commerce, follows the lines of least resistance, and so long as lumber could be secured from timber that was still cheap and could be transported along easy water routes, there was little inducement to

penetrate the mountains and fit for log driving their rocky and rapid streams. Nature thus preserved, not only in New York but in Pennsylvania, West Virginia and other states, in close relation to the greatest centers of lumber consumption, these supplies of timber which could be drawn upon when the supplies at a greater distance, but more easily available, should become depleted.

In addition to these supplies of virgin timber, so long preserved from the ax and saw of the logger, New York was and is peculiarly adapted in soil, climate and topography to the growth of trees. If fire can but be kept out, Nature from her own resources will soon restock the forest areas and replace with a young and thrifty growth the trees that have been felled. The process of reforestation has been going on from the beginning of white settlement, and thousands of acres are wooded today that were treeless when white explorers first looked upon them. The Indians had cleared patches for their cornfields, and larger areas to furnish attractive grazing grounds for the deer. But when the white man began to make his own clearings and to stop the forest fires, these old treeless areas were soon restocked. The whole area of the State, from the Hudson to Lake Erie and from the Delaware to the St. Lawrence, was one of Nature's most favored forest nurseries, in which the trees grew not only rapidly and luxuriantly but in wonderful variety. That growth has continued in spite of the clearings of the agriculturists or the operations of lumbermen; so that, until the present time, the Empire State, rich in many ways, is still rich in timber, though her forest resources are sadly depleted.

In previous chapters the locations and dates of establishment of the early mills have been pointed out. What the product of the State was at any given period prior to 1840 we know not, but perhaps the curious might be able to arrive at some approximate conclusion in regard to it from data previously given in the first volume of this work. The census of 1810 made no mention of New York, but that of 1820 accredited the Empire State with 272 sawmills. Inasmuch as Ohio at that time was reported to have 136, and as almost every stream in New York down which or from which lumber might be floated or barged had its mill, the report was probably far under the mark. The first census of any real value beyond the enumeration of population was that of 1840. The public report of that census accredited New York with 6,356 sawmills and a product valued at $3,891,302. The historian may be pardoned for doubting the reliability of these statistics. There are evidences in the census reports of those days which would indicate that sometimes the enumerators counted saws instead of merely establishments, and that a sawmill building with half a dozen old fashioned sash or muley saws

might be counted as six mills instead of one. This supposition is further supported by the fact that by the census of 1850 the number of establishments had decreased to 4,625, while the product had increased in value to $8,032,983. The increase in value is credible because it was a decade of increased business and of improvement in sawmill machinery and methods, but it seems unlikely that there should have been so large a decrease in the number of establishments.

Beginning with the census of 1850, the decennial reports on the industries of the country have been in the main reliable and sufficiently uniform in the schedules employed to admit of comparison. The following table shows the leading items in regard to the lumber industry for each of the regular census years, beginning with 1850 and ending with 1900.

COMPARATIVE LUMBER STATISTICS, 1850–1900—NEW YORK.

Year.	Number of establishments.	Capital.	Number of wage-earners.	Wages.	Cost of materials used.	Value of products.
1850	4,625	$ 8,032,983	10,840	$2,863,188	$ 6,813,130	$13,126,759
1860	3,035	7,931,708	8,798	2,369,720	5,531,704	10,597,595
1870	3,510	15,110,981	15,409	3,438,601	11,228,613	21,238,228
1880	2,822	13,230,934	11,445	2,162,972	9,119,263	14,356,910
1890[1]	1,734	21,430,739	12,981	3,369,484	8,865,653	17,160,547
1900[1]	1,765	21,873,203	9,243	3,653,383	7,153,962	15,766,977

[1]Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

FOREST PRODUCTS IN DETAIL.

The twelfth census entered with great minuteness into details as to the product of sawmill establishments, logging camps and other institutions. As in other states, the divisions were "Rough Lumber," "Shingles," "Cooperage Materials," "Other Sawed Products" and "Timber Camp Products." Rough lumber is presented under two classes—conifers and hardwoods—with the leading varieties of each, while shingles are accredited to the woods chiefly producing them. The following table shows the principal facts as to the kind of lumber and other products produced from the various woods:

FOREST PRODUCTS OF NEW YORK—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
Yellow pine	310,000	$ 5,590
White pine	116,947,000	1,677,364
Hemlock	303,621,000	3,370,260
Spruce	244,966,000	2,837,297
Cedar	1,538,000	77,940
Tamarack	131,000	1,310
All other conifers	15,000	170
Total, conifers	667,528,000	$7,969,931
HARDWOODS:		
Ash	8,956,000	$151,429
Birch	12,909,000	195,091
Chestnut	13,942,000	185,745
Elm	16,157,000	213,034
Hickory	1,073,000	21,075

Basswood	29,867,000	$ 425,187
Oak	44,750,000	874,365
Poplar	1,249,000	26,638
Black walnut	141,000	5,185
Maple	51,436,000	757,156
Sycamore	70,000	1,075
Other hardwoods	26,676,000	1,460,435
Total, hardwoods	207,226,000	$4,316,415
Total, rough lumber	874,754,000	$12,286,346

SHINGLES.

	Quantity, pieces.	Value.
White pine	29,045,000	$ 69,582
Cypress	150,000	525
Cedar	19,463,000	47,346
Hemlock	52,850,000	115,741
Spruce	54,868,000	99,674
All hardwoods	3,918,000	9,542
Total, shingles	160,294,000	$342,414

COOPERAGE MATERIALS.

	Quantity.	Value.
Hoops, pieces	12,371,000	$ 94,746
Staves, pieces	42,585,000	259,008
Headings, sets	8,534,260	284,986
Total, cooperage materials	.....	$638,740

OTHER SAWED PRODUCTS.

Bobbin and spool stock, feet b. m.	352,000	$ 5,632
Furniture stock, feet b. m.	1,598,000	40,037
Agricultural implement stock, feet b. m.	503,000	7,306
Carriage and wagon stock, feet b. m.	852,000	19,718
Pickets and palings, feet b. m.	290,000	3,358
Lath, pieces	66,468,000	124,262
All other sawed products	.....	900,796
Total, other sawed products	.....	$1,101,109

TIMBER CAMP PRODUCTS.

Basket stock, cords	100	$ 300
Cooperage stock, cords	1,374	11,100
Excelsior stock, cords	190	1,042
Fence posts, pieces	152,112	15,624
Hop poles, pieces	14,100	140
Hewed timber, feet b. m.	101,000	1,297
Logs cut for export, feet b. m.	421,000	3,905
Logs cut for domestic sale, feet b. m.	28,195,000	173,579
Handle stock, cords	655	2,685
Hemlock bark, cords	32,948	139,197
Oak bark, cords	144	478
Piles, pieces	4,054	7,946
Railway ties, pieces	225,115	86,145
Rived or shaved shingles, pieces	6,000	18
Masts and spars, pieces	13	300
Telegraph poles, pieces	9,824	14,210
Wheel stock, cords	200	700
Charcoal, bushels	900,348	42,200
All other products	.....	183,547
Amount received for contract work	.....	12,400
Total, timber camp products	.....	$696,813
Total, planing mill products	$3,393,544	
Less value of lumber used	2,370,467	$1,023,077
Grand total, value forest products	.....	$16,088,499

It will be observed from the above that in 1899, the calendar year covered by the tables, more lumber was produced from hemlock than from any other species. Although southeastern New York is within the extreme northern range of yellow pine, it is possible that the product reported was cut in New York mills from logs brought from the South. Otherwise, the product is from timber of home growth, with perhaps

some slight interchange of timber between New York and Pennsylvania on the one hand, and New York and Vermont on the other. The next most important wood was spruce, which is the prevailing timber in the Adirondacks, but white pine was still an important timber with its product of almost 117,000,000 feet.

A considerable portion of the Empire State, especially the central and western parts, was originally largely covered with hardwoods; but, inasmuch as the soil in which broad-leaved trees grow is especially adapted to agriculture, these sections have largely been cleared and the product of hardwood lumber is comparatively small. In the census year the entire product of this class was 207,226,000 feet, notwithstanding hardwoods were native throughout the entire area of the State, while pine, spruce and hemlock were confined to certain districts. In the shingle product, of over 160,000,000 pieces, spruce, hemlock, white pine and cedar led in the order named.

Specialties in lumber manufacture have been developed to a high point in New York, which fact is accountable for the extensive list under the headings "Other Sawed Products" and "Timber Camp Products." The total value of the forest products of the State, whether sawed or otherwise, was $16,088,499, which, while small compared with some other states, yet maintained for New York its position as a lumber state of importance.

In 1905 the National Census Bureau, then lately established, compiled a report which had chiefly to do with the industries of the United States. Its purpose, so far as the lumber industry was concerned, was to determine, among other things, the volume of the sawed lumber product available for the general markets, and therefore custom mills were omitted. In order to compare the results of that census with the one of 1900 it was necessary to revise the report on the latter and eliminate custom mills from it also. A comparison between the census reports of 1900 and 1905, covering, respectively, the calendar years 1899 and 1904, is therefore a fair one, although, by the omission of custom mills, the figures for 1900 are smaller than those of the previous tables. This summary follows:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—NEW YORK.

Comparative Preliminary Summary—1900 and 1905.

	1900.	1905.
Number of establishments	1,134	[1]820
Capital	$13,413,300	[1]$12,599,876
Salaried officials, clerks, etc.:		
Number	385	[1]290
Salaries	$302,854	[1]$298,591
Wage-earners:		
Average number	10,405	[1]8,186
Wages	$3,801,319	[1]$3,649,389
Miscellaneous expenses	$1,102,105	$1,454,697
Cost of materials used[2]	$6,953,967	[1]$6,938,405
Value of products[2]	15,131,385	[1]$14,939,115

[1]Decrease.

[2]Includes a duplication—the value of rough lumber, which in 1905 amounted to $1,628,702, remanufactured in planing mills connected with sawmills producing it.

Quantity, Value and Principal Varieties of Rough Lumber:

White pine:		
Thousand feet b. m.	105,194	86,947
Value	$1,516,270	$1,529,995
Hemlock:		
Thousand feet b. m.	256,788	175,566
Value	$2,853,103	$2,450,378
Spruce:		
Thousand feet b. m.	237,904	157,708
Value	$2,757,415	$2,500,607
Cedar:		
Thousand feet b. m.	1,536	16,783
Value	$77,900	$653,333
Birch:		
Thousand feet b. m.	12,417	21,977
Value	$188,251	$372,976
Chestnut:		
Thousand feet b. m.	11,798	7,337
Value	$154,830	$133,673
Basswood:		
Thousand feet b. m.	23,177	9,249
Value	$331,904	$164,277
Oak:		
Thousand feet b. m.	39,680	20,751
Value	$788,048	$443,531
Maple:		
Thousand feet b. m.	45,251	37,666
Value	$670,498	$646,066
Elm:		
Thousand feet b. m.	12,339	4,611
Value	$162,870	$72,853
All other:		
Thousand feet b. m.	39,170	43,381
Value	$1,702,673	$2,416,577
Total quantity, thousand feet b. m.	785,254	581,976
Total value	$11,203,762	$11,384,266

In the five years there was shown a decrease of over 200,000,000 feet of sawed lumber, or about 26 percent. During that decade a number of extensive operations in the north, cutting pine and spruce in the Adirondack region, and in the south and west cutting hemlock chiefly, had gone out of existence; but still a substantial volume of production was maintained, with an assurance of permanence based largely upon the forest policy of the State government.

In addition to statistics gathered by the National government are those secured by the Forest, Fish and Game Commission of the State of New York. Prior to 1905 statistics of forest products were secured only for the Adirondack and Catskill regions; but in that year the entire State was covered, with a result that showed a much larger production than determined by the Census Bureau at Washington. The details of these figures are given in Chapter XXIII. Suffice it to say here that, according to these reports, the sawlog production of the State during 1905 was 112,069,951 feet of pine, 211,076,474 feet of spruce, 179,549,818 feet of hemlock and 247,584,222 feet of hardwoods, making a total of 750,280,465 feet of sawlogs, added to which was 461,789,704 feet of timber cut for pulpwood, cooperage, chemical plants, etc., making a grand total of 1,212,070,169 feet. If shingles, lath, railroad ties and headings were to be reduced to board measure a still further addition would be made to the above grand total.

FOREIGN TRADE.

Although since its settlement the State of New York has been a lumber

producing one, its consumption of forest products has been so great that for many years it has largely depended upon outside resources for its supplies. Located, as it is, close to the heavy lumber producing districts of Canada, with easy and cheap means of transportation, it is not surprising that the State should have drawn heavily from the forests of Ontario and, to some extent, from those of Quebec and the Maritime Provinces. During the time that southern Ontario, with its timber directly tributary to Lakes Ontario and Erie, was a lumber producer of importance, New York was a large customer of that section; but with the greater development of manufacturing in the Ottawa Valley and on the Georgian Bay waters, it became a customer of those sections also.

Via Lake Ontario Canadian lumber could be and was received at the various New York ports along that lake, and also, if market exigencies should demand, at Buffalo and Dunkirk via the Welland Canal. At these same terminals could be received Ottawa Valley lumber, which reached them through the Rideau Canal, extending from the city of Ottawa to Kingston. Georgian Bay lumber most naturally reached New York via Lakes Huron and Erie, though some of this lumber went through the Welland Canal to the ports on Lake Ontario. Ottawa Valley lumber found its chief water means of transportation into New York State via the Richelieu River and canals, entering at Plattsburg, or being carried in bond through to the entry ports of Albany or New York.

There are eleven customs house districts in the State of New York. The Champlain district has for its port of entry Plattsburg. Next in order to the west is the district of Oswegatchie, whose port of entry is Ogdensburg, on the upper St. Lawrence. Next to the west is Cape Vincent, lying at the head of the St. Lawrence and at the extreme foot of Lake Ontario. The next port to the westward is Oswego, on Lake Ontario. Still further west is the district of Genesee, with Rochester as its port of entry. The most western district which may be considered tributary to Lake Ontario is the Niagara with its custom house located at Niagara Falls.

Tributary to Lake Erie is the Buffalo Creek customs district, with Buffalo as its port of entry. The only other port on Lake Erie is Dunkirk. Interior ports are Syracuse and Albany. The latter, however, is in position to receive lumber not only by either the Champlain or Erie canals, but by vessel up the Hudson, which it has sometimes done, though rarely. The only Atlantic port, but outweighing all others in importance except as to the importation of rough lumber, is New York, which draws lumber from all the Maritime Provinces of Canada—pine chiefly from St. John, but spruce and cedar shingles chiefly from Nova Scotia.

The records of the National Treasury Department at Washington, which has charge of the customs, are preserved in shape available for use

back only to 1856, but in the tables which follow it will be observed that the importations of sawed lumber and shingles apparently amounted to but little at any of the ports until after the Canadian Confederation of 1867 and the abolition of the reciprocity treaty in 1866. The blanks in the years previous thereto do not, however, mean that there were no importations of lumber, but simply that they were not separately recorded, inasmuch as no duty was collected. It was in 1871 that a specific duty was for the first time placed upon lumber coming from Canada and, therefore, since that time the records are continuous.

The following table shows the importations of wood, manufactured and unmanufactured, at Plattsburg, port of entry of the Champlain district:

IMPORTS—CHAMPLAIN (PLATTSBURG), NEW YORK.

Year.	Unmanufactured.			Manufactured.
	Sawed lumber.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Value.	Value.
1856	.....	.....	.....	$ 4,559
1857	.....	.....	.....	2,168
1858	.....	.....	.....	1,235
1859	.....	.....	.....	3,428
1860	.....	.....	.....	2,918
1861	.....	.....	.....	894
1862	.....	.....	.....	692
1864	75,000	$ 77	.....	4,991
1865	.....	8	.....	1,084
1868	98,996,000	1,151,122	$104,629	44,508
1869	.....	.....	.....	[1]31,158
1870	.....	.....	.....	[1]1,337,880
1871	114,880,000	1,116,291	111,958	37,076
1872	117,014,000	1,200,413	148,070	32,904
1873	146,378,000	1,671,631	155,332	25,111
1874	107,922,000	1,325,770	137,121	36,771
1875	89,427,000	1,000,403	109,167	80,818
1876	82,618,000	865,574	61,516	22,493
1877	84,011,000	785,384	51,697	13,767
1878	87,360,000	781,372	46,486	4
1879	109,794,000	931,408	42,016	15,114
1880	110,009,000	1,039,402	28,335	20,536
1881	123,051,000	1,359,869	55,292	24,242
1882	112,241,000	1,349,877	108,367	8,209
1883	111,990,000	1,413,457	117,763	5,848
1884	143,078,000	1,774,011	106,503	19,619
1885	114,525,000	1,389,158	59,132	5,063
1886	120,503,000	1,483,506	108,362	16,402
1887	143,557,000	1,985,189	155,805	18,402
1888	152,393,000	2,042,139	288,933	26,430
1889	151,233,000	1,764,245	214,672	20,379
1890	170,804,000	2,087,698	176,551	21,427
1891	218,052,000	2,419,198	197,245	136,168
1892	188,594,000	2,404,866	246,166	136,382
1893	238,238,000	2,760,581	375,724	108,814
1894	190,657,000	2,465,334	341,073	98,540
1895	179,267,000	2,261,604	191,910	88,746
1896	199,556,000	2,402,499	409,383	134,988
1897	245,624,000	2,713,012	425,489	149,996
1898	102,665,000	999,790	407,543	137,825
1899	113,521,000	1,216,336	376,785	28,820
1900	181,788,000	2,039,210	479,054	151,306
1901	97,406,000	1,386,514	686,439	170,125
1902	101,218,000	1,529,393	757,813	187,639
1903	94,351,000	1,426,819	863,364	226,288
1904	91,003,000	1,370,466	820,797	189,052
1905	118,062,000	1,797,146	1,047,800	481,138

[1] All wood and manufactures of except cabinet wood.

Under the title, "All other unmanufactured," in the above table are included some interesting items. Cabinet woods figured largely until 1894, when that item disappeared from the record. In 1894 the value was given as $153,610. No explanation is found in the treasury records of this sudden abandonment of an important schedule. Shingle importations were in small amounts during the early part of the period covered, but reached dimensions of some importance in 1891. Previous to that year the largest importations had been only a little over 5,000,000 pieces. In 1891 there were 7,647,000 shingles imported, valued at $13,714. A gradual increase is noted until 1902, when the importations were 67,674,000 pieces, valued at $130,715. In 1905 there were 59,024,000 pieces, valued at $129,002. Included in "All manufactures" in the preceding table is wood pulp, the figures regarding which are given further on.

Owing to its position in commanding the chief water route from the Ottawa Valley to the United States, the importations of sawed lumber at Plattsburg have been among the largest in the country and have been better maintained than those of some ports which once surpassed it. As a point of export of American forest products Plattsburg has never been of importance since the early days when Lake Champlain supplied large quantities of logs and timber for the St. Lawrence River trade; but of recent years there has been, on the whole, a growing export through this customs district of American lumber, such as hardwoods, which are needed by the industries of Lower Canada, and find this route a convenient one. The following table shows the total exportations for the years 1856 to 1896, inclusive, and the exportations by years beginning with 1897:

EXPORTS—PLATTSBURG, NEW YORK.

Year.	Unmanufactured.			Manufactured.	
	Sawed lumber.		All other unmanufactured.	Furniture.	All other manufactures.
	Feet.	Value.	Value.	Value.	Value.
1856 to 1896	2,724,000	$47,169	$70,838	$525,635	$455,731
1897	1,963,000	39,538	1,276	6,989	51,550
1898	3,381,000	60,273	1,040	3,358	67,689
1899	3,252,000	48,909	7,353	50,100	71,347
1900	4,066,000	62,906	11,909	35,200	59,179
1901	1,489,000	23,268	3,331	47,203	76,554
1902	3,519,000	52,805	6,806	56,636	97,079
1903	1,863,000	28,993	8,326	64,376	79,812
1904	3,668,000	69,739	23,439	76,142	81,068
1905	3,229,000	64,813	36,892	68,401	102,049

Since 1890, when pulp was first separately enumerated, the importations and exportations of that commodity through Plattsburg have been as follows:

IMPORTS AND EXPORTS OF WOOD PULP—PLATTSBURG, NEW YORK.

Year.	Imports.		Exports.	
	Quantity.	Value.	Quantity.	Value.
1890	409,151 lbs.	$ 9,281	.....	.....
1891	4,858,172 "	111,216	.....	.....
1892	2,382 tons	117,797	.....	.....
1893	2,002 "	96,754	.....	.....
1894	2,146 "	93,662	.....	.....
1895	3,688 "	82,762	.....	.....
1896	6,944 "	117,981	.....	.....
1897	9,507 "	139,696	.....	.....
1898	7,716 "	110,769	440,902 lbs.	$ 3,882
1899	1,779 "	28,820	842,272 "	10,724
1900	4,303 "	151,306	991,906 "	14,609
1901	3,814 "	170,125	160,271 "	2,760
1902	5,228 "	187,639	454,915 "	8,243
1903	8,385 "	226,288	394,859 "	7,810
1904	7,193 "	186,847	372,615 "	6,758
1905	21,986 "	481,138	247,610 "	2,668

An important entry for Canadian lumber has been for many years Ogdensburg, near the head of the St. Lawrence. Its importations since 1871, prior to which they were unimportant, have been as follows:

IMPORTS—OSWEGATCHIE (OGDENSBURG), NEW YORK.

Year.	Unmanufactured.					Manufactured.
	Sawed lumber.		Shingles.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1871	15,171,000	$181,143	.....	$48,629	$ 6,497	$ 38,451
1872	16,302,000	204,560	17,061,000	33,750	10,376	40,969
1873	28,940,000	400,972	28,724,000	67,146	34,138	16,364
1874	23,835,000	345,063	28,855,000	73,788	152,510	4,391
1875	10,738,000	138,425	14,694,000	37,486	119,757	3,916
1876	6,626,000	78,453	5,111,000	13,274	18,065	18,930
1877	11,535,000	115,405	4,136,000	8,024	27,050	31,321
1878	20,814,000	211,472	7,302,000	14,784	14,021	37,154
1879	20,583,000	194,353	2,757,000	5,647	9,175	16,675
1880	36,148,000	384,348	4,685,000	9,802	40,337	23,488
1881	46,576,000	536,434	9,009,000	18,648	74,443	21,707
1882	38,733,000	507,434	8,896,000	20,392	104,171	5,014
1883	38,270,000	531,577	5,188,000	13,830	104,850	16,892
1884	36,337,000	480,377	4,559,000	10,806	99,396	1,559
1885	39,476,000	470,391	3,862,000	8,834	75,115	1,040
1886	50,043,000	619,427	2,839,000	5,517	64,001	8,374
1887	41,547,000	594,434	5,426,000	10,007	16,848	17,350
1888	40,257,000	553,781	6,638,000	12,728	34,022	5,446
1889	53,741,000	698,715	4,020,000	8,326	203,215	2,656
1890	55,960,000	654,964	6,176,000	10,030	92,729	16,953
1891	63,235,000	783,073	9,122,000	14,129	21,040	27,122
1892	51,896,000	621,722	11,198,000	18,671	36,890	34,872
1893	56,738,000	666,802	15,162,000	27,497	46,007	33,818
1894	52,719,000	673,142	12,140,000	23,168	37,564	42,456
1895	39,127,000	510,751	1,605,000	3,223	45,756	42,340
1896	59,751,000	708,878	.....	.....	67,189	30,107
1897	72,561,000	804,855	.....	.....	79,539	12,765
1898	37,834,000	389,274	11,588,000	20,540	49,338	14,288
1899	57,071,000	592,800	21,320,000	37,501	106,277	2,344
1900	76,024,000	924,367	26,030,000	45,132	84,790	47,921
1901	50,505,000	754,286	32,650,000	56,092	120,086	45,189
1902	77,672,000	1,241,355	48,554,000	89,984	131,829	23,049
1903	91,754,000	1,450,593	38,984,000	74,539	161,142	84,290
1904	71,768,000	1,196,465	42,691,000	91,070	129,946	85,853
1905	103,272,000	1,889,983	34,483,000	79,482	151,444	171,590

The exports of wood from Oswegatchie have never been large, and during the last fifty years have aggregated only about $2,180,000. A statement as to its exports will be found under the heading, "Minor Ports of New York."

CAPE VINCENT.

The imports at Cape Vincent have been light always, but of sufficient importance to justify being included in this chapter in the following table:

IMPORTS—CAPE VINCENT, NEW YORK.

Year.	Unmanufactured.					Manufactured.
	Boards, deals, planks.		Shingles.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1856	.....	.....	.....	.....	.....	$ 648
1857	.....	.....	.....	.....	.....	567
1858	.....	.....	.....	.....	.....	441
1859	.....	.....	.....	.....	.....	467
1860	.....	.....	.....	.....	.....	543
1861	.....	.....	.....	.....	.....	190
1865	.....	.....	.....	.....	.....	849
1868	11,791,000	$109,407	.....	.....	$13,263	3,626
1869	.....	.....	.....	.....	5,677	178,527
1870	.....	.....	.....	.....	.....	266,950
1871	5,374,000	53,368	.....	$ 7,082	17,037	1,941
1872	6,306,000	70,442	3,874,000	6,885	45,376	1,375
1873	5,639,000	69,970	3,757,000	6,857	61,459	893
1874	3,866,000	49,225	5,613,000	12,502	80,551	558
1875	2,205,000	28,605	5,552,000	11,651	64,737	1,561
1876	2,248,000	21,973	948,000	1,837	19,678	718
1877	1,485,000	13,107	649,000	1,306	24,065	602
1878	2,209,000	21,451	1,120,000	2,085	23,289	732
1879	1,876,000	17,340	2,515,000	4,224	28,431	623
1880	2,445,000	29,882	1,540,000	3,034	21,411	837
1881	2,360,000	28,338	1,996,000	3,848	33,151	1,358
1882	2,807,000	36,882	2,819,000	6,303	50,344	683
1883	3,723,000	53,514	1,782,000	4,600	39,715	737
1884	3,209,000	43,306	6,380,000	12,194	43,468	473
1885	2,998,000	40,605	7,881,000	18,413	24,455	466
1886	2,991,000	33,854	7,184,000	12,475	26,844	856
1887	3,727,000	44,761	6,368,000	11,040	51,288	843
1888	5,401,000	88,757	7,153,000	12,122	46,896	4,721
1889	2,908,000	36,160	6,803,000	11,138	64,120	618
1890	2,759,000	33,252	9,579,000	17,105	55,397	625
1891	3,673,000	41,237	11,308,000	19,190	24,238	414
1892	3,902,000	41,665	8,696,000	14,266	37,773	918
1893	3,610,000	47,609	13,224,000	23,207	37,409	479
1894	2,209,000	28,386	12,443,000	23,506	25,950	332
1895	3,176,000	47,906	863,000	1,731	23,103	358
1896	2,405,000	31,337	.....	.....	25,422	413
1897	3,050,000	37,522	.....	.....	30,860	219
1898	1,466,000	18,863	3,499,000	5,793	20,831	187
1899	1,853,000	22,721	7,476,000	12,384	19,302	604
1900	2,870,000	37,222	7,420,000	12,279	22,012	337
1901	2,643,000	37,766	8,479,000	14,235	16,490	308
1902	3,223,000	44,923	11,541,000	21,527	13,558	1,412
1903	3,003,000	43,275	7,487,000	14,360	6,958	1,767
1904	2,464,000	35,750	6,142,000	13,011	36,118	438
1905	2,460,000	39,851	5,747,000	12,351	49,845	847

[1]Includes all wood other than cabinet wood.
[2]Includes all wood imports.

OSWEGO.

The most important New York point for importation of sawed lumber until 1895 was Oswego. In that year, however, importations dropped heavily and never recovered anything like their former magnitude. The statement of Oswego imports since 1856 is as shown herewith. The Na-

tional Starch Company, E. W. Rathbun & Co., the Diamond Match Company and the Standard Oil Company of New York, by their extensive use of Canadian lumber, have built up and still maintain at Oswego a large importing business which otherwise would have been comparatively insignificant. The National Starch Company and the Standard Oil Company are large manufacturers of box shooks and boxes for their own use. The Diamond Match Company consumes large quantities of lumber in the manufacture of matches. E. W. Rathbun & Co. are manufacturers of and wholesale dealers in lumber, shingles, sash, doors, blinds, etc., on a large scale. This concern owns about 400,000 acres of timber lands in Ontario, where it maintains, in various places, sawmill plants, a sash

IMPORTS—OSWEGO, NEW YORK.

Year.	Unmanufactured.					Manufactured.
	Boards, deals, planks.		Shingles.		All other unmanufactured.	All manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1856	.....	.....	.....	.....	.....	$ 3,166
1857	.....	.....	.....	.....	.....	1,496
1858	.....	.....	.....	.....	.....	4,336
1859	.....	.....	.....	.....	.....	4,323
1860	.....	.....	.....	.....	$ 3,077	3,252
1861	.....	.....	.....	.....	4,016	526
1865	.....	.....	.....	.....	.....	3,049
1868	.....	.....	.....	.....	2,655,137	56,696
1869	.....	.....	.....	.....	.....	12,793,750
1870	.....	.....	.....	.....	.....	13,324,980
1871	275,130,000	$2,833,320	.....	$ 49,536	63,638	818
1872	260,924,000	2,871,613	24,236,000	56,586	86,070	480
1873	298,881,000	3,716,362	23,102,000	58,457	85,017	573
1874	238,828,000	2,991,275	35,559,000	101,948	93,040	205
1875	170,631,000	1,988,362	35,396,000	94,041	54,793	150
1876	142,157,000	1,543,518	22,894,000	53,922	47,458	222
1877	121,100,000	1,256,086	20,093,000	41,721	51,690	160
1878	119,311,000	1,230,224	21,208,000	46,805	46,266	113
1879	108,459,000	1,099,776	18,005,000	36,682	35,420	4,735
1880	180,196,000	1,911,522	17,826,000	37,841	79,327	2,800
1881	183,224,000	2,039,865	22,668,000	52,214	93,263	3,657
1882	214,323,000	2,741,487	28,549,000	71,947	104,939	5,814
1883	194,007,000	2,784,880	27,747,000	76,520	147,088	135
1884	184,413,000	2,597,465	21,870,000	60,486	87,783	7,059
1885	182,564,000	2,401,892	16,490,000	40,306	56,372	56
1886	166,555,000	2,017,892	11,647,000	30,093	73,389	118
1887	144,756,000	1,731,999	14,478,000	32,965	67,357	.....
1888	149,974,000	1,884,241	41,249,000	85,964	106,508	130
1889	151,035,000	1,821,481	50,627,000	105,011	143,907	.....
1890	151,761,000	1,718,965	28,756,000	64,098	109,361	.....
1891	153,447,000	1,684,531	23,468,000	49,163	83,571	.....
1892	121,229,000	1,337,630	37,364,000	72,477	61,573	4
1893	119,436,000	1,404,512	38,813,000	68,177	54,416	.....
1894	104,682,000	1,255,180	32,046,000	56,070	36,270	50
1895	68,373,000	835,201	2,794,000	6,524	58,029	19
1896	57,138,000	634,536	.....	.....	66,203	.....
1897	69,576,000	749,981	.....	.....	76,758	.....
1898	35,779,000	337,978	19,909,000	34,124	18,688	3,185
1899	34,365,000	314,945	25,007,000	39,354	40,052	.....
1900	35,211,000	345,031	29,546,000	46,036	69,094	990
1901	36,766,000	365,907	23,345,000	35,664	37,151	90
1902	40,751,000	477,229	26,038,000	40,008	44,729	1,660
1903	26,635,000	326,436	22,010,000	38,782	77,788	20
1904	26,077,000	338,132	15,004,000	28,110	121,287	64
1905	34,167,000	461,388	15,659,000	27,474	160,005	43

[1]Includes all wood and manufactures of wood.

and door factory doing a large export business, etc., and makes Oswego its chief point of distribution for the United States.

All of these concerns draw the larger part of their lumber, chiefly white pine, from Canada, finding it more advantageous to pay the duty and obtain it from Ontario than to purchase the American product. This fact, coupled with the admirable location of Oswego for easy shipments from Canada, is responsible for the importance of Oswego as a place of lumber importation.

GENESEE.

The customs district of Genesee, of which Rochester is the port, has always been a light importer, but the volume of its importations of forest products is shown in the following table:

IMPORTS—GENESEE (ROCHESTER), NEW YORK.

Year	Unmanufactured.					Manufactured.
	Sawed lumber.		Shingles.		All other unmanufactured.	All manufactures
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1856	.....	.....	.....	.....	.....	$ 1,205
1857	.....	.....	.....	.....	.....	457
1858	.....	.....	.....	.....	.....	489
1859	.....	.....	.....	.....	.....	779
1860	.....	.....	.....	.....	.....	935
1861	.....	.....	.....	.....	.....	354
1865	.....	.....	.....	.....	$ 4,136	161
1868	8,106,000	$ 72,851	.....	.....	65,381	20,251
1869	.....	.....	.....	.....	1,328	[1]110,726
1870	.....	.....	.....	.....	.....	199,226
1871	9,778,000	81,398	.....	$ 9,424	52,986	1,038
1872	8,136,000	79,198	6,288,000	14,773	49,513	742
1873	11,258,000	118,950	9,913,000	23,232	104,383	664
1874	6,780,000	70,853	10,023,000	23,888	114,917	478
1875	4,398,000	46,359	6,187,000	14,991	80,594	195
1876	3,205,000	32,230	2,369,000	5,181	51,165	1,547
1877	1,281,000	12,251	2,170,000	4,359	27,053	992
1878	1,818,000	18,975	4,269,000	9,005	34,524	2,422
1879	649,000	6,669	3,635,000	7,620	40,036	892
1880	.....	.....	8,055,000	18,149	75,276	1,185
1881	1,712,000	23,803	22,850,000	51,890	92,421	604
1882	5,513,000	72,330	29,025,000	78,168	117,128	403
1883	3,189,000	50,907	23,083,000	80,089	93,416	556
1884	1,063,000	16,044	13,356,000	44,531	26,793	771
1885	919,000	15,436	6,031,000	15,789	17,961	1,154
1886	679,000	10,429	4,159,000	9,639	12,243	910
1887	686,000	10,435	3,702,000	8,203	10,517	1,709
1888	576,000	8,551	6,554,000	14,229	43,487	1,002
1889	430,000	6,139	5,794,000	13,473	58,223	1,842
1890	576,000	7,908	4,999,000	10,684	60,410	1,983
1891	711,000	9,510	7,598,000	17,190	64,497	2,808
1892	213,000	2,223	4,700,000	9,902	31,962	4,922
1893	409,000	5,785	6,690,000	14,699	39,439	4,801
1894	399,000	5,465	17,895,000	42,665	24,992	2,630
1895	87,000	1,075	1,452,000	3,905	34,012	3,802
1896	707,000	7,148	.....	.....	17,694	5,176
1897	404,000	3,985	.....	.....	30,490	3,950
1898	87,000	651	412,000	835	11,328	13,135
1899	119,000	682	100,000	240	451	13,462
1900	.....	.....	.....	.....	1,416	37,197
1901	.....	.....	.....	.....	3,334	17,333
1902	.....	.....	.....	.....	3,467	35,127
1903	346,000	4,035	1,889,000	4,573	22,914	7,962
1904	211,000	2,305	752,000	2,098	18,603	5,563
1905	92,000	1,054	974,000	3,132	9,377	4,986

[1]Includes all wood and manufactures of wood, except cabinet wood.

NIAGARA.

The Niagara customs district, of which Niagara Falls is the port of entry, has been and is important in the supply of Canadian lumber to American markets, as through it passes a large amount of lumber coming by rail from southern Ontario and Georgian Bay. Its record has been as follows:

IMPORTS—NIAGARA (NIAGARA FALLS), NEW YORK.

Year.	Unmanufactured.					Manufactured.
	Sawed lumber.		Shingles		All other unmanufactured.	All manufactures.
	Feet.	Value.	Pieces.	Value.	Value.	Value.
1856	.....	.....	.....	.....	.....	$ 1,482
1857	.....	.....	.....	.....	$ 552	368
1858	.....	.....	.....	.....	47	2,354
1859	.....	.....	.....	.....	.....	3,503
1860	.....	.....	.....	.....	.....	3,628
1861	.....	.....	.....	.....	.....	1,444
1865	.....	.....	.....	.....	1,299	2,032
1868	2,474,000	$20,754	.....	.....	46,715	9,003
1869	.....	.....	.....	.....	.....	191,853
1870	.....	.....	.....	.....	.....	152,580
1871	5,176,000	46,162	.....	$ 16,484	7,428	12,198
1872	2,868,000	31,462	5,081,000	11,182	6,329	51,787
1873	5,446,000	71,589	3,888,000	9,624	18,794	7,915
1874	2,968,000	42,174	3,584,000	10,226	23,625	8,025
1875	9,984,000	96,249	1,161,000	3,115	9,717	10,253
1876	11,847,000	121,957	153,000	306	1,129	18,147
1877	14,647,000	143,526	100,000	188	4,767	13,345
1878	5,901,000	64,503	600,000	1,345	3,510	24,413
1879	7,553,000	88,070	888,000	2,262	6,266	24,840
1880	9,969,000	112,641	1,488,000	2,963	38,524	37,723
1881	7,323,000	100,530	5,590,000	13,545	33,348	57,321
1882	13,949,000	198,718	6,549,000	17,359	56,894	30,035
1883	11,142,000	183,979	7,496,000	19,201	57,027	18,483
1884	15,988,000	236,210	2,496,000	6,119	84,733	28,698
1885	30,709,000	400,014	1,902,000	4,760	260,390	47,132
1886	29,459,000	394,219	1,125,000	2,927	296,028	52,232
1887	34,716,000	490,383	421,000	868	317,198	41,371
1888	44,520,000	632,254	5,347,000	12,395	388,724	32,827
1889	56,227,000	849,568	11,567,000	27,034	454,282	26,890
1890	52,731,000	702,665	16,857,000	32,212	387,749	53,715
1891	63,844,000	789,825	29,734,000	69,621	392,507	96,017
1892	60,356,000	729,396	47,505,000	95,846	441,250	30,564
1893	69,736,000	847,074	56,753,000	113,907	427,382	45,801
1894	25,477,000	345,985	29,592,000	64,531	443,648	80,748
1895	36,496,000	512,001	2,594,000	4,822	433,062	70,866
1896	40,040,000	503,995	.....	.....	414,557	51,525
1897	74,074,000	797,405	.....	.....	475,105	47,381
1898	16,897,000	182,851	32,562,000	51,499	258,653	22,440
1899	28,224,000	326,170	34,953,000	55,505	227,431	45,747
1900	66,248,000	856,089	32,462,000	62,221	316,248	91,402
1901	50,351,000	727,310	25,970,000	58,751	331,154	80,522
1902	49,673,000	791,321	44,167,000	89,663	253,451	91,873
1903	47,180,000	762,381	25,089,000	55,720	241,039	116,909
1904	47,586,000	726,765	5,566,000	14,277	192,144	55,616
1905	67,570,000	1,120,671	2,647,000	5,321	108,264	161,732

[1]Includes all wood and manufactures of wood except cabinet wood.

BUFFALO CREEK.

The customs district of Buffalo Creek has within it the important lumber centers of Buffalo and North Tonawanda, but since its natural source of supply by water, so far as Canadian lumber is concerned, is Georgian Bay only, its importations have not been as large as those of some other ports of much less importance as lumber centers. Its volume

of importations has been more uniformly maintained than that of most ports, and since 1890 it has received nearly three-quarters of a billion feet of lumber, as well as a large number of shingles and other forest products. Its record is as follows:

IMPORTS—BUFFALO CREEK (BUFFALO), NEW YORK.

Year	Unmanufactured.			Manufactured.
	Sawed lumber.		All other unmanufactured.	All manufactures.
	Feet	Value.	Value.	Value.
1856	.....	.....	.....	$ 5,500
1857	.....	.....	.....	6,666
1858	.....	.....	.....	2,711
1859	.....	.....	.....	13,388
1860	.....	.....	.....	27,626
1861	.....	.....	.....	13,744
1865	.....	.....	$ 55,275	4,545
1868	1,142,000	$ 13,257	520,287	6,225
1869	.....	.....	.....	490,783
1870	.....	.....	.....	526,701
1871	31,513,000	285,309	248,071	935
1872	35,915,000	306,933	167,452	1,357
1873	52,314,000	537,498	230,206	1,556
1874	34,104,000	359,347	411,538	6,267
1875	19,896,000	240,866	143,876	19,015
1876	18,078,000	235,342	119,375	1,746
1877	14,029,000	177,809	167,491	2,363
1878	19,005,000	229,336	161,652	15,358
1879	22,369,000	245,929	220,111	20,022
1880	36,294,000	428,335	253,466	7,969
1881	41,443,000	503,608	320,103	16,405
1882	53,279,000	674,633	560,102	32,712
1883	36,757,000	474,015	658,403	55,735
1884	44,604,000	582,711	614,228	39,619
1885	42,126,000	513,747	305,382	6,214
1886	43,574,000	459,696	227,703	4,237
1887	33,940,000	404,321	194,051	4,145
1888	22,276,000	251,878	251,041	2,854
1889	32,297,000	378,522	297,876	6,124
1890	41,453,000	473,284	279,381	11,189
1891	75,857,000	855,390	323,295	8,762
1892	54,842,000	618,954	380,457	6,411
1893	48,433,000	557,060	445,074	6,437
1894	24,387,000	302,976	298,941	4,937
1895	22,924,000	289,546	270,129	7,581
1896	39,554,000	502,604	274,988	7,483
1897	41,602,000	484,620	275,125	5,068
1898	16,015,000	174,827	251,684	5,400
1899	29,765,000	317,146	220,953	5,119
1900	64,413,000	756,441	225,208	17,152
1901	46,051,000	638,735	196,721	16,774
1902	77,169,000	1,130,266	212,194	21,034
1903	86,635,000	1,538,212	205,692	23,907
1904	56,146,000	984,817	85,161	10,483
1905	50,162,000	849,748	80,218	65,965

NEW YORK CITY.

The only Atlantic port of New York State is the city of New York. Great in its ocean trade as that city is, it would seem that it should excel all other ports in the State in the importations of lumber; but such has not been the case. In some years its receipts of lumber from the Maritime Provinces have been large, the record having been 53,729,000 feet of sawed

lumber in 1896, but ordinarily they have been small. The quantity of lumber entered at New York is, however, no indication of the magnitude of its consumption of Canadian lumber, for it is the principal destination of all the lumber entering the State along the northern border from Plattsburg to Buffalo. The following is the record of the importations of unmanufactured and manufactured wood into New York since 1856:

IMPORTS—NEW YORK CITY.

Year.	Unmanufactured.			Manufactured.	
	Sawed lumber.		All other unmanufactured.	Cabinet ware and furniture.	All other manufactures.
	Feet.	Value.	Value.	Value.	Value.
1856	.....	.....	$ 365,282	$ 30,927	$ 497,480
1857	.....	.....	474,019	26,469	493,015
1858	.....	.....	332,853	22,638	110,019
1859	.....	.....	421,884	17,261	271,801
1860	.....	.....	559,678	15,843	312,502
1861	.....	.....	414,551	28,816	263,030
1862	.....	$ 1,415	292,465	.....	177,657
1863	.....	156	376,071	266,199	.....
1864	81,000	1,045	580,028	218,220	.....
1865	.....	110	550,112	130,510	.....
1868	729,000	5,278	387,831	[1] 491,451	.....
1869	.....	.....	562,485	.....	2997,253
1870	.....	.....	563,650	.....	2967,225
1871	11,556,000	73,917	1,613,761	763,429	.....
1872	8,796,000	62,829	893,008	[1]1,070,515	.....
1873	1,826,000	18,386	825,534	[1]1,039,997	.....
1874	332,000	2,931	1,035,832	[1] 799,307	.....
1875	130,000	2,528	891,813	[1] 656,641	.....
1876	21,000	354	701,966	[1] 634,131	.....
1877	9,000	1,477	502,280	[1] 461,880	.....
1878	15,000	4,185	678,097	[1] 496,359	.....
1879	311,000	2,474	895,736	[1] 586,469	.....
1880	208,000	8,256	1,710,975	[1] 673,217	.....
1881	3,754,000	42,954	1,949,400	[1] 836,441	.....
1882	2,111,000	22,337	2,210,115	[1]1,131,126	.....
1883	487,000	11,792	2,315,369	[1]1,173,341	.....
1884	1,548,000	14,148	2,357,245	242,166	766,093
1885	1,512,000	21,787	2,090,275	228,631	626,190
1886	1,725,000	17,971	1,912,997	239,593	681,858
1887	4,620,000	53,831	1,803,793	316,539	862,799
1888	10,482,000	111,017	1,827,072	272,284	899,960
1889	2,967,000	45,180	1,832,024	275,803	965,258
1890	4,950,000	83,020	2,015,602	408,155	2,256,597
1891	3,921,000	38,537	2,172,662	356,048	2,521,523
1892	3,933,000	34,925	2,501,769	471,581	2,502,946
1893	5,266,000	69,613	2,928,135	269,576	3,254,099
1894	1,533,000	16,763	1,871,327	202,175	1,974,753
1895	39,214,000	389,339	1,969,156	292,964	1,567,131
1896	53,729,000	547,647	2,215,264	281,430	1,783,976
1897	31,038,000	319,911	1,797,356	192,826	1,348,249
1898	5,278,000	43,202	2,220,456	213,722	1,129,927
1899	1,394,000	23,109	2,114,869	251,148	1,304,615
1900	15,003,000	150,420	3,177,851	313,013	2,004,694
1901	4,288,000	56,001	3,598,754	511,456	1,591,502
1902	5,119,000	56,257	3,461,981	586,022	1,691,812
1903	8,232,000	159,122	2,537,463	799,731	2,328,200
1904	15,108,000	231,203	4,122,486	576,044	2,334,937
1905	29,691,000	395,045	3,304,098	583,467	2,378,606

[1]Includes all manufactures.
[2]Includes all wood and manufactures of wood except cabinet wood.

While in sawed lumber the above record is not imposing, in other items New York is preëminent. It is the chief port of entry for cabinet

woods, while in commodities manufactured from wood, as cabinet ware, furniture, wood pulp, etc., it is emphatically the leader. Its mahogany and cedar log imports for the last seven years are as follows:

COMPARATIVE TABLE OF MAHOGANY AND CEDAR LOG RECEIPTS AT NEW YORK.[1]

Kind.	Total arrivals, 1901.	Total arrivals, 1902.	Total arrivals, 1903.	Total arrivals, 1904.	Total arrivals, 1905.	Total arrivals, 1906.	Arrivals in Dec., 1906.
Cuban mahogany logs	30,574	48,347	37,935	12,509	14,629	31,063	1,029
Cuban cedar logs	81,468	75,837	116,450	95,768	88,350	136,449	15,756
Mexican mahogany logs	15,754	13,880	18,290	14,086	6,389	8,327	728
Mexican cedar logs	10,195	8,098	8,759	6,563	1,623	5,311	140
Central and South American mahogany	6,603	6,814	7,159	5,683	5,229	3,126	720
Central and South American cedar	437	33	2,151	104	1,362	1,522	897
African mahogany logs	4,533	6,321	6,302	4,680	4,204	11,156	1,590
Total	149,564	159,330	197,046	139,393	121,786	196,954	20,860

[1]From mahogany and cedar report of George F. Herriman, New York, January 1, 1907.

The importations and exportations of wood pulp at the port of New York since they have been a matter of separate record are shown in the following table, although included in the import and export tables of New York City under the heading, "All other manufactures:"

IMPORTATIONS AND EXPORTATIONS OF WOOD PULP AT NEW YORK CITY.

Year.	Imports.		Exports.	
	Quantity.	Value.	Quantity.	Value.
1890	68,971,666 lbs.	$1,274,330	.....	.....
1891	54,381,001 "	1,076,953	.....	.....
1892	19,044 tons	949,897	.....	.....
1893	31,628 "	1,552,466	.....	.....
1894	13,780 "	712,884	.....	.....
1895	7,803 "	337,002	.....	.....
1896	7,631 "	313,486	.....	.....
1897	3,007 "	133,061	.....	.....
1898	2,607 "	109,917	14,303,043 lbs.	$ 255,389
1899	2,231 "	84,357	13,886,425 "	254,892
1900	15,924 "	625,840	9,378,258 "	172,967
1901	6,033 "	308,740	14,752,228 "	325,723
1902	7,018 "	351,518	12,050,125 "	247,771
1903	19,868 "	908,932	11,003,224 "	225,060
1904	18,681 "	813,336	18,921,250 "	380,651
1905	15,868 "	787,631	13,453,087 "	277,247

As the leading port of the United States, New York holds a high position in respect to the exports of forest products and manufactures thereof. Indeed, it is the only port in New York State whose exports of this class are worthy of special tabulation. Even so, its exports at the present time of unmanufactured lumber do not equal those of some other ports, to which are directly tributary the great lumber producing sections of the country. It occupies as high a position as it does because its world covering trade commands business which its location in respect to lumber production alone would not warrant. In its exports of manufactures of

wood, however, New York easily is the leader among the ports of the country. The record of its exportations since 1856 of both unmanufactured and manufactured wood is as follows:

EXPORTS, NEW YORK CITY.

Year.	Unmanufactured.			Manufactured.	
	Sawed lumber.		All other unmanufactured.	Furniture.	All other manufactures.
	Feet.	Value.	Value.	Value.	Value.
1856	27,469,000	$ 554,911	$1,219,902	$252,003	$773,783
1857	30,091,000	646,524	1,338,551	278,572	874,713
1858	31,058,000	751,334	1,766,044	331,281	413,806
1859	34,419,000	808,798	1,490,135	425,894	524,539
1860	26,198,000	592,834	1,626,953	527,491	794,868
1861	26,949,000	564,865	1,612,546	387,806	653,778
1862	32,828,000	722,226	1,945,345	373,583	738,054
1863	38,149,000	1,019,181	2,650,830	662,607	1,274,346
1864	25,626,000	894,658	3,342,680	698,245	479,542
1865	24,116,000	1,061,246	5,220,973	1,164,702	797,148
1867	3,058,000	139,206	4,433,074	488,746	466,249
1868	9,751,000	328,098	4,226,154	621,099	467,110
1869	11,446,000	381,930	3,547,224	567,481	790,575
1870	17,772,000	564,108	5,096,304	600,520	653,585
1871	11,042,000	342,492	2,214,551	524,910	579,324
1872	16,831,000	561,245	2,480,881	872,439	684,106
1873	15,431,000	593,993	3,387,949	1,057,228	756,249
1874	11,665,000	439,854	3,216,248	1,022,480	923,645
1875	16,906,000	474,706	2,489,731	883,754	1,196,149
1876	13,836,000	350,196	2,239,971	871,597	1,184,729
1877	44,027,000	1,373,332	2,771,565	946,796	1,038,413
1878	32,001,000	662,301	2,126,806	1,097,721	1,253,644
1879	34,040,000	627,833	2,280,585	1,110,884	1,348,223
1880	35,858,000	708,993	2,277,931	979,570	1,443,658
1881	48,331,000	1,067,858	2,242,233	1,095,761	1,526,853
1882	40,881,000	1,142,074	3,089,634	1,300,958	1,838,192
1883	56,541,000	1,423,724	3,453,094	1,467,844	1,822,216
1884	56,170,000	1,432,641	2,962,635	1,458,591	1,793,202
1885	56,721,000	1,294,662	2,649,327	1,216,418	1,534,881
1886	55,401,000	1,323,741	2,512,615	1,354,632	1,451,714
1887	61,778,000	1,519,732	2,276,642	1,372,605	1,479,036
1888	60,499,000	1,784,365	2,604,438	1,700,368	1,750,152
1889	85,090,000	2,598,812	2,123,658	1,865,374	1,925,487
1890	85,917,000	2,362,299	2,040,770	2,332,377	1,955,840
1891	91,775,000	2,389,784	1,776,979	2,180,607	1,753,695
1892	89,457,000	2,394,711	1,690,787	2,195,345	1,909,829
1893	86,396,000	2,255,064	1,977,248	2,119,816	2,020,928
1894	95,234,000	2,361,767	1,914,559	2,057,189	1,952,184
1895	87,311,000	2,275,038	1,928,245	1,917,214	1,880,178
1896	92,939,000	2,239,862	2,275,782	2,028,238	2,284,341
1897	85,113,000	2,134,934	2,454,524	2,351,540	2,522,960
1898	64,568,000	1,497,746	1,988,023	2,308,813	2,524,577
1899	82,130,000	1,926,954	2,193,458	1,981,178	2,761,961
1900	72,844,000	1,992,312	2,895,613	2,366,649	3,204,518
1901	56,358,000	1,590,982	3,540,218	2,361,907	3,321,181
1902	48,294,000	1,401,906	2,858,456	2,363,545	3,487,052
1903	44,194,000	1,383,803	2,916,086	2,642,214	4,484,009
1904	38,645,000	1,373,614	2,917,377	2,516,574	4,502,458
1905	28,822,000	987,858	3,161,072	2,413,961	3,803,252

MINOR PORTS OF NEW YORK.

Such in respect to imports are Albany, Dunkirk, Syracuse and others. The figures for individual years for all of these ports are so small and have so little significance in relation to the grand aggregate of forest product importations that they have been grouped in one table, the figures being the totals of 1856 to 1905, inclusive, as follows:

IMPORTS—MINOR PORTS OF NEW YORK. TOTAL, 1856-1905.

Customs Districts.	Unmanufactured.		Manufactured.	
	Sawed lumber.	All other unmanufactured.	Cabinet ware and furniture.	All other manufactures.
Albany	$ 956	$ 20	$14,561	$ 6,266
Dunkirk	126,064	124,547	310	26,497
Syracuse	.....	10	6,784	100,356
Sacket Harbor	.....	.....	.....	75
Sag Harbor	3,055	20,152	.....	27,797
Lake Ports	16,246	45,767	34,234	13,302

In respect to exportations of forest products all but New York City and Plattsburg may be considered minor ports. The following table shows the totals under each main division for each port since and including 1856:

EXPORTS—MINOR PORTS OF NEW YORK. TOTAL, 1856-1905.

Customs Districts.	Unmanufactured.		Manufactured.	
	Sawed lumber	All other unmanufactured.	Cabinet ware and furniture.	All other manufactures.
Albany	.....	.....	.....	.....
Buffalo Creek	$954,308	$139,514	$512,219	$ 1,385,187
Champlain	498,413	171,200	934,040	1,141,580
Cape Vincent	5,787	873,740	168,932	332,768
Dunkirk	.....	.....	.....	.....
Genesee	9,404	8,651	317,217	132,017
Niagara	269,523	36,804	414,620	1,412,306
Oswego	39,186	191,279	310,892	197,607
Oswegatchie	365,161	97,993	673,351	1,043,148
Sacket Harbor	.....	.....	644	529
Syracuse	.....	.....	.....	.....
Lake Ports	3,989	6,215	236,808	101,233

CHAPTER XXVIII.

NEW JERSEY—POLITICAL AND FORESTAL HISTORY.

All that part of the United States bounded on the east by the Hudson River and the Atlantic Ocean; on the south by Delaware Bay; on the west by the Delaware River until it reaches a point of 41 degrees 41 minutes of latitude, from which point the boundary runs in a straight line to the Hudson River, in 40 degrees of latitude, the foregoing comprising the present State of New Jersey, was debatable ground up to the year 1664 among the colonists who acknowledged sovereignty to England, Holland and Sweden. This territory between the years 1610 and 1640 was claimed and included in the area occupied by the Dutch under the name of New Netherland. In 1640, however, the colonists of New Haven formed a company, styled the Delaware Company, and commissioned Captain Turner, one of its members, to proceed to Delaware Bay and purchase lands in that region. He was instructed not to buy territory which rightfully belonged to the Dutch or Swedes. The captain, however, paid little attention to boundaries and bought from the Indians nearly the whole southwestern coast of New Jersey. The attempted colonization which followed this movement proved abortive; for the Dutch and Swedes, notwithstanding mutual jealousies, made common cause against these intruders and broke up their settlements. The Swedes, in turn, totally ignored the claims and presence of the Dutch and for about fifteen years from 1640 settled in groups along the valley of the Delaware. These settlements were so isolated that they, unsupported as they were by the home government, became easy victims to the harassing policy of the Dutch and were forced finally to submit to their domination. This was about 1654 and from that time up to 1664 New Jersey was under the absolute sway of Holland.

In 1664 England was forced to recognize the fact that the control of the valleys of the Hudson and Delaware by the Dutch separated New England, in the north, from her colonies in the south, and fitted out, in the summer of 1664, a naval expedition which forced the Dutch of New Netherland to capitulate. Charles II, of England, gave the title to this newly acquired territory to his brother James, Duke of York. James immediately transferred his rights in the territory, which practically makes up the present State of New Jersey, to Lord Berkeley and Sir George Carteret. This territory was given the name of New Jersey in

honor of Carteret's defense of the island of Jersey against the forces of Cromwell. An English settlement was made the same year, located on the site of the present city of Elizabeth, and colonists from New Haven established a second English settlement in 1667.

In 1673 New Jersey was retaken and held several months by the Dutch. The territory was restored to the English, however, by the Treaty of Westminster, February 19, 1674, and in 1676 New Jersey was divided into two provinces—East Jersey and West Jersey. This division followed the sale by Lord Berkeley of his half interest of the original grant. According to the "History of New Jersey" by J. R. Sypher and E. A. Apgar, Lord Berkeley "sold his one-half interest in the province for less than $5,000. John Fenwick and Edward Byllinge, two English Quakers, were the purchasers. A dispute arose between the two proprietors about the division of their property and William Penn, who afterward became the founder of Pennsylvania, was chosen arbitrator to settle the difficulty and succeeded to the satisfaction of all parties interested. Fenwick sailed from London in 1675 in the ship *Griffith*, with his family and a small company of Quakers. This was the first English vessel that came to New Jersey with immigrants. The party sailed up the Delaware Bay and, entering a creek, landed on its banks three and a half miles from the Delaware. This creek and the settlement founded on it Fenwick named Salem. This was the first English settlement permanently established in West Jersey."

In 1682 East Jersey was bought at public auction for £3,400 by William Penn and associates, most of whom were Quakers. In 1688 the entire territory was placed under the authority of Sir Edmund Andros, and in 1702 the two Jerseys were united into one province.

At the outbreak of the war with the mother country in 1776, New Jersey declared itself independent of British authority, and took an important part in the fighting which followed. It was the third state to ratify the Federal Constitution. New Jersey's history since that time has been comparatively uneventful.

THE PRIMITIVE FOREST.

The genera and species of the primitive forest growth of New Jersey were in large variety. The northern part was covered with a mixed forest, composed principally of hardwoods, while the southern part was a continuous forest of yellow pine with cypress and cedar in the lowlands. According to Michaux, in his "North American Sylva," the white cedar was very plentiful in New Jersey. He said in reference to this species: "In the maritime districts of New Jersey, Maryland and Virginia it nearly fills the extensive marshes which lie adjacent to salt meadows and are exposed in high tide to the overflow of the sea. In New Jersey it covers

almost alone the whole surface of the swamps, of which the tupelo and red maple occupy skirts. Farther south it is mingled with the cypress by which it is at length entirely supplanted."

Deputy Governor Gawen Lawrie, in 1684, in a letter to a friend in London describing the country of East Jersey, said: "The trees grow generally not thick, but some places ten, in some fifteen, and in some twenty-five or thirty upon an acre; this I find generally, but in some particular places there is one hundred upon an acre; but that is very rare. The trees are very tall and straight, the general are oak, beech, walnut, chestnut . . . there is likewise gumtree, cedar, whitewood, like our fir tree."[1]

Peter Kalm traveled in the United States during the years 1748 and 1749 and spent several months in New Jersey with Swedish friends. He made a special study of tree growth, and excerpts from his "Travels Into North America" therefore will be found of interest as showing the species and distribution of merchantable timber at that time in New Jersey. Under date of November, 1748, he said:

In all the parts of Pennsylvania where I have been, I have found few fir woods; on the other hand, they are abundant in New Jersey, and especially in the lower part of that province. We afterwards found all the day long no other trees, than such as have deciduous leaves; most of these were oaks of different sorts, and of considerable height, but they stood every where far enough asunder to admit a chaise to pass through the wood without any inconvenience, there being seldom any shrubs or underwood between the trees, to obstruct the way. . .

The pines which we had seen today, and which I have mentioned before, were of that kind which has double leaves and oblong cones, covered with aculeated scales. The English to distinguish it call it the Jersey Pine. Commonly there were only two spines or leaves in one fascicle, as in our common Swedish pines, but sometimes three; the cones had long spines so that they were difficult to be touched. These pines looked at a distance wholly like the Swedish ones, so that if the cones were not regarded, they might easily be taken for the same species. Of these pines they make a great quantity of tar. . .

December, 1748. Penn's Neck, New Jersey. The country around Penn's Neck has the same qualities as that about other places in this part of New Jersey. For the ground consists chiefly of sand, with a thin stratum of black soil. It is not very hilly, but chiefly flat, and in most places covered with open woods of such trees as have annual leaves, especially the oak. . .

The woods of these parts consist of all sorts of trees, but chiefly of oak and hickory. These woods have certainly never been cut down, and have always grown without hindrance. It might therefore be expected that there are trees of uncommon great age to be found in them; but it happens otherwise, and there are very few trees three hundred years old. Most of them are only two hundred years old; and this convinced me that trees have the same quality as animals, and die after they arrive at a certain age. Thus we find great woods here, but when the trees in them have stood an hundred and fifty or an hundred and eighty years, they are either rotting within, or losing their

[1] "History of New Jersey," Samuel Smith, 1765.

crown, or their wood becomes quite soft, or their roots are no longer able to draw in sufficient nourishment, or they die from some other cause. Therefore when storms blow . . . the trees are broken either just above the root, or in the middle, or at the summit. Several trees are likewise torn out with their roots by the power or the winds. The storms thus cause great devastation in these forests. Everywhere you see trees thrown down by the winds, after they are too much weakened by one or the other of the above mentioned causes to be able to resist their fury. Fire likewise breaks out often in the woods, and burns the trees half way from the root, so that a violent gust of wind easily throws them down. . . .

Some trees are more inclined to putrify than others. The tupelo-tree (*Nyssa*), the tulip-tree (*Liriodendron*), and the sweet gum-tree (*Liquidambar*), become rotten in a short time. The hiccory did not take much time, and the black oak fell sooner to pieces than white oak; but this was owing to circumstances. . . . The joiners say, that among the trees of this country they chiefly use the black walnut-trees, the wild cherry-trees, and the curled maple. Of the black walnut-trees (*Juglans nigra*) there is yet a sufficient quantity. However, careless people take pains enough to destroy them, and some peasants even use them for fewel. The wood of the wild-cherry trees (*Prunus virginiana*) is very good, and looks exceedingly well; it has a yellow color, and the older the furniture is, which is made of it, the better it looks. But it is already difficult to get at it, for they have cut it everywhere and plant it nowhere. The curled maple (*Acer rubrum*) is a species of the common red maple, but likewise very difficult to be got. You may cut down many trees without finding the wood which you want. The wood of the sweet gum-tree (*Liquidambar*) is merely employed in joiners' work, such as tables and other furniture. But it must not be brought near the fire, because it warps. The firs and the white cedars (*Cupressus thyoides*) [now known as *Chamæcyparis thyoides*] are likewise made use of by the joiners for different sorts of work. The millers who attended the mill which stood here, said, that the axle-trees of the wheels of the mill were made of white oak, and that they continued good three or four years, but that the firwood does not keep so well, and the pulleys are made of the wood of the white walnut-tree, because it is the hardest which can be got here. The wood of mulberry-trees is of all others reckoned the most excellent for pegs and plugs in ships and boats.

Rapaapo, New Jersey. A tree which grows in the swamps here and in other parts of America goes by the name of "white juniper tree." Its stem, indeed, looks like one of our old, tall and straight juniper trees in Sweden, but the leaves are different and the wood is white. The English call it white cedar because the boards which are made of the wood are like those made of cedar. But neither of these names are just, for the tree is of the cypress kind.[2] It always grows in wet ground or swamps. It is difficult to come to them because the ground between the little hillocks is full of water. The trees stand both on the hillocks and in the water. They grow very close together and have straight, thick and tall stems, but they were greatly reduced in number to what they have been before. In such places where they are left to grow up, they grow as tall and as thick as the tallest fir trees. They preserve their green leaves both in winter and summer; the tall ones have no branches on the lower parts of the stem.

Marshes where these trees grow are called cedar swamps. These cedar swamps are numerous in New Jersey and likewise in some parts of Pennsylvania and New York. The most northerly place where it has been hitherto found is near Goshen, in New York, under 41 degrees and 25 minutes of north latitude, as I am informed by Doctor

[2]*Cupressus thyoides*, Linn. Spec. pl., page 1422. *Cupressus americana fructuminima*, Miller's "Gardner Dictionary."

Colden. To the north of Goshen it has not been found in the woods. The white cedar is one of the trees which resist the most to putrefaction; and when it is put above ground it will last longer than under ground; therefore, it is employed for many purposes; it makes good fences and posts which are to be put into the ground; but in this point, the red cedar is still preferable to the white; it likewise makes good canoes. The young trees are employed for hoops around barrels, tuns, etc., because they are thin and pliable; the thick and tall trees afford timber and wood for coopers' work. The houses which are built of it surpass in duration those which are built of American oak. Many of the houses in Rapaapo were made of this white cedar wood; but the main thing which the white cedar affords is the best kind of shingles. The white cedar shingles are preferred to all others. . . . In many parts of New York province, where the white cedar does not grow, the people, however, have their houses roofed with cedar shingles, which they get from other parts. To that purpose great quantities of shingles are annually exported from Egg Harbour and other parts of New Jersey to the town of New York, from whence they are distributed throughout the province. A quantity of white cedar wood is likewise exported every year to the West Indies, for shingles, pipe staves, etc. Thus, the inhabitants are very busy here, not only to lessen the number of these trees, but even to extirpate them entirely. They are here (and in many other places) bent only upon their own present advantage, utterly regardless of posterity. By these means many cedar swamps are already cut destitute of cedars, having only young shoots left, and I plainly observed, by counting the circles around the stem, that they do not grow up very quickly, but require a great deal of time before they can be cut for timber. It is well known that a tree gets only one circle every year; a stem eighteen inches in diameter had 108 circles around the thick end; another, seventeen inches in diameter had 116; and another two feet in diameter had 142 circles upon it. Thus, near eighty years' growth is required before a white cedar raised from seed can be used for timber. . . .

The red juniper tree is another tree which I have mentioned very frequently in some of my accounts. The Swedes have given it the name of red juniper, because the wood is very red and fine within. The English call it red cedar and the French *cedre rouge*. However, the Swedish name is more proper, as the tree belongs to the junipers.[3] At its first growth it has a deal of similarity to the Swedish juniper,[4] but after it is grown up it gets quite different leaves. The berry exactly resembles that of the Swedish juniper, in regard to its color and shape; however, they are not so big, though the red cedar grows very tall. At Raccoon, (New Jersey), these trees stood single, and were not very tall. But at other places I have seen them standing together in clusters; they like the same ground as the common Swedish juniper, especially on the rising banks of rivers, and on other rising ground in a dry and frequently in a poor soil. I have seen them growing in abundance, as thick and tall as the tallest of fir trees, on poor, dry and sandy heaths. Towards Canada, or in the most northerly places, where I have seen them, they commonly choose the steep sides of the mountains and there they grow, promiscuously with the common juniper. The most northerly places where I have found them wild in the woods is in Canada, eighteen French miles to the southward of the Fort Saint Jean, or St. John, in about 44 degrees 35 minutes North latitude.

The region known as the "Pines," covering the southeastern portion of Monmouth, all of the counties of Ocean and Atlantic, the larger half of Burlington, the eastern part of Camden, Gloucester, Salem and Cum-

[3] *Juniperus virginiana*, Linn. Spec. pl. p. 114.
[4] *Juniperus communis*, Linn. Spec. pl. p. 1470.

berland and the northern portion of Cape May, at one time sustained three great industries—bog iron, glass and charcoal—which gave employment to thousands of persons. The Leonard brothers, James and Henry, were the pioneers in the bog iron industry, having started manufacturing this product about the year 1676. The charcoal industry furnished considerable wealth to the State before anthracite and bituminous coal came into general use, for it was from the pines that charcoal was largely made. This charcoal supplied the markets of New Jersey, New York and Philadelphia. An interesting account of the "Pines" is given by Francis B. Lee in his "New Jersey as a Colony and as a State," and is interpolated here as giving a concise history of this region from colonial days down. He said:

Upon the mainland lay the "Pines," a vast irregularly shaped tract of land clothed with pines, oak, isolated clumps of chestnut, and embracing tracts of white cedar, gum and other woods. Covering the southeastern portion of the County of Monmouth, practically all of Ocean and Atlantic counties, the larger half of Burlington County, the eastern parts of Camden, Salem, Gloucester and Cumberland counties, and the upper portion of Cape May County, this wooded area stood as a wall between the settlements on the Delaware and the sea. In the almost imperial holdings of the boards of proprietors of East and West Jersey the "Pines" were considered as being of comparatively little value. A generation elapsed before the forests in the immediate vicinage of the first settlements were cleared, and before any demand was made upon the timber area in the interior.

The very abundance of wood led to its waste. From the Indian the settler learned the method of the quickest extermination of the forests—the use of fire. Particularly was this true in West New Jersey, and so great were the disasters resulting from conflagrations that the Legislature as early as 1683 prohibited anyone, under penalty, "from firing the woods to the prejudice of the inhabitants of this province" on or before the 20th of March. The act permitted owners to "fire within their own bounds, for their own conveniency, who are also to take care that the fire run not out of their own bounds, nor prejudice any other person." Two years before, the Legislature had passed an act providing a punishment for timber thieving from surveyed land.

By 1700 the "Pines" had been crossed by surveyors, and much of the timber had been purchased from the proprietors. Thousands of acres still remained in the hands of the boards of East and West Jersey, but the work of destruction had commenced. It was the story of devastation and criminal waste. Constant fires during the spring and summer ranged across the colony until fuel was exhausted or rains put out the flames. Forest economics was an unknown science, the purchaser seeing in his tract simply an opportunity to secure a yield of useful materials. Modern forestry embracing such elements as an appeal to the artistic sense, a resort of health value to invalids, and a regulator of water flow, was beyond the comprehension of those who purchased proprietary rights.

The greed of owners and the thieving of lawless persons became so great as to lead to legislative interference. In March 1713–14, an act was passed prohibiting the common practice of stealing timber, cedar, pine staves, and poles, and of boring for and extracting turpentine. A statute also forbade the exportation of pipe and hogshead staves to neighboring provinces, owing to the rapid destruction of the forests,—legislation which remained in force practically throughout the colonial period. In

1743 an act was passed, applicable to the eastern division of the province, laying duties upon logs, timber, planks, vessel supplies, staves, and heading, except firewood, "exported to any of His Majesty's Colonies upon the Continent of America," which act was also made applicable to the common lands within the limits of the charter of Bergen township. To further protect the forests, in 1772 a statute provided that cullers should be appointed to inspect staves, heading, hoops, shingles, boards and plank "exported beyond sea,"—legislation necessitated by the development of the West India trade, where cedar and pine were exchanged for rum, sugar and molasses.

Throughout the "Pines" the sawmills heralded the advent of permanent settlements. These mills were erected as early as 1700-25, and furnished the basis of some colonial fortunes. Mainly they were operated by agents of owners, the proprietors living on the plantations facing the Delaware and its tributary streams. Narrow winding roads, laid out along the lines of the least natural resistance, penetrated the forests and, starting from larger arteries of travel, ended in cul-de-sacs surrounded by timber. From these roads many of the highways of South Jersey have been evolved.

Alongside of the large lumbering industry stood smaller attempts to create wealth. In Gloucester County, before 1700, one Robert Styles, a worker in pitch tar and rosin, was accounted by a contemporaneous writer "an Excellent Artist in that sort of Work, for he delivers it as clear as any Gum Arabic." There was considerable trade in "fat pine knots" for feul and illumination, the latter use passing away upon the general introduction of cheap candles and illuminating fluids. Others followed Styles in tar making, but later the industry languished, to be revived during the Civil War, when the tar kilns partially supplied a portion of the demand caused by cutting off the southern product. For the old fashioned spinning wheels persimmon wood was used, while tobacco pipes were and are still made from the butts of the laurel, commonly known as "nigger heads." The irregularly grained and proverbially tough wood of the sour gum was employed for wagon hubs, blocks for the manufacture of beaver hats, for mauls and other utensils on the farms and for appliances on coastwise vessels.

"The oak, in its varieties, and the chestnut were an early source of revenue to the planters of the Orange Mountains. In the last century, and until after the War of the Revolution, the storehouses in the lower part of the city of New York were generally built of wood. White oak timber, dressed with the broadax and framed, ready to be set up, was largely furnished on contract from these mountain forests. It was transported by teams to Paulus Hook, and delivered in the city. Mathias Dodd, whose home was in Grove Street, East Orange, was not only a prosperous farmer, but he also derived generous profits from his timber lands. Upon the delivery of the material in New York, he received his pay in silver dollars. The framed buildings below Fulton Street, and east of Broadway, in New York, were all consumed in the great fire of 1835. The making of white oak staves for pipes, and of black oak staves for hogsheads, to be sent to the West Indies, was a large and lucrative industry after the peace of 1783."[5]

Franklin B. Hough prepared in 1877 a "Report upon Forestry" for the Government under the direction of the Commissioner of Agriculture.

[5] "History of the Oranges," Wickes, 1892.

In securing data for New Jersey, Mr. Hough received some interesting matter from Charles Stokes, of Rancocas, Burlington County, who was then in his eighty-seventh year, and who had spent his whole life in that section of New Jersey. Mr. Stokes wrote "that he has seen great changes in the forest, but no perceptible changes of climate, his conclusions being 'that seasons differ, but nature repeats itself, as is said of history.' With respect to change in forest growth, Mr. Stokes remarks that the native timber trees consisted mainly of oak, hickory, walnut, chestnut, gum, maple, and red and white cedar, tulip, poplar, etc. The oaks were the white, black, red, chestnut, peach or willow, turkey, pin and Spanish oaks, and mostly of large size and excellent quality. The pine was the yellow and swamp varieties, which formed nearly or quite half the forests of the eastern part of the State bordering upon the sea." Mr. Stokes further said:

About the beginning of the present century were seen, along the shore of the Delaware River, another description of pine, called "spruce" (*Pinus inops*), [now known as *P. virginiana*, scrub pine] which has spread extensively in an easterly direction, by the seed being wafted by the westerly winds; and in many places where lands have been worn out under the former system of exhaustive farming, the spruce pine has taken possession, and grown in an astonishing manner; at first so thick as to be almost impenetrable for man or beast. In a short time, however, the weaker part would die out, and so continue to thin itself, while the stronger would increase in height, and in a few years be fit to cut into cord wood. When fairly set, I think it will be safe to say it will grow two cords of wood to the acre per year. It is thought to make much better fuel than the native pine, and for framework in buildings it is also superior, being taller and of greater strength. This pine has been propagated both by the seed and also by transplanting when young, as a profitable crop. Sometimes small oaks and chestnuts may be seen among the spruce pines when they get thinned out by growth, the seeds having been carried, perhaps, by squirrels or birds, and when the pines are cut, they having possession will get the start of the seedling pines, and so grow together, and soon make a most beautiful and valuable forest of tall, slender and straight timber. I should think if the spruce pine a year old and acorns and chestnuts [were] planted at about the same time on suitable or worn-out land, the prospect might be as good as the above, which has in so many instances proved a success. The red cedar has been extensively spread by birds, especially along fences, and with proper care may be made both ornamental and profitable. The white cedar, that grows in swamps at the headwaters of the rivers emptying into the ocean and Delaware River, has been converted into shingles, lumber and fence rails, and when removed the young growth quickly follows, much after the manner of the growth of the spruce pine, but it takes a longer time to mature. I see but little difficulty in accounting for a different kind of timber taking the place of a growth which has been cut and removed. Most kinds of old ripe timber never sprout so as to make a forest after being felled, giving full opportunity for the spread and growth of the seeds of other kinds brought by birds or otherwise, to vegetate and grow, as well as young trees already started, which may grow without obstruction. As pine stumps do not sprout, their reproduction from their own seed is not easy; but if we cut off a second or young growth of oak, we find the succession will invariably be oak. This rule will, I believe, govern in all cases.

"The value of the new growth of spruce pine depends very much upon location and state of growth. In the most favorable conditions, Mr. Stokes estimates the value from $2 to $4 on the stump, and the yield at fifty cords to the acre. At the lowest estimate this would give a value of $100 for the wood, or $120 for the wood and land. The time of growth before cutting is about twenty-five to thirty years. The estimate upon this basis would be:

Value of land, $20, at 6 percent for 30 years	$36
Taxes	14
Total cost of investment	$50

"Profit, $50, to which might be added $10 or $20 per acre, by a proper mixture of chestnut. Mr. Stokes remarks: 'I have now in view a few acres of such timber, say of ten years' growth, on land not worth $20 per acre, which I would value at not less than $100, were it mine.' "

The swamps of New Jersey were almost exclusively occupied by white cedar, which grew from seventy to eighty feet in height and sometimes more than three feet in diameter. Where the trees grew in close proximity the trunks were straight and had no branches for fifty to sixty feet. Lumber made from this wood very early became an article of export to the neighboring colonies and the West Indies.

MINING BURIED CEDAR.

About 1812 were discovered enormous quantities of cedar buried beneath the Dennisville swamp. The cedar forests, it is thought, grew in a fresh water lake or swamp, the action of which was necessary to their existence. According to Clarence Demine and Dr. Maurice Beaseley, eminent geologists of southern New Jersey, the sea either broke in upon the swamps or the land subsided. This destroyed the life of many of them, and in time a great windfall came and leveled the forest.

In the late '80's the fallen and submerged cedar forests of Dennisville still afforded employment to scores of people engaged in their excavation, and were a source of constant interest to geologists. There are standing at the present day no such immense specimens of the cedar anywhere in the country as were found embedded deep in the muck of these swamps. Some of the trees that have been unearthed were fully six feet in diameter and stocks four feet through were common.

Mr. Hough in his report on forestry took up this interesting subject and his remarks on same are here reproduced:

An enormous quantity of white cedar timber (*Cupressus thyoides*) is found buried in the salt marshes, sound and fit for use, and a considerable business is carried on in mining this timber and splitting it into shingles for market. In some places it is found so near the surface that fragments of the roots and branches are seen projecting above the marsh, while in other cases the whole is covered with smooth meadow sods, and

there is no indication of what is beneath till it is sounded by thrusting a rod down into the mud. It is most commonly found on the headwaters of streams. West Creek, East Creek, Dennis Creek, Great Cedar Swamp Creek, and their small branches have cedar swamps through their whole lengths.

The timber which is buried in the swamps undergoes scarcely any change, and trees which have been buried hundreds of years are as sound as ever. It would seem that most of the timber which ever grew in these swamps is still preserved in them. Trunks of trees are found buried at all depths, quite down to the gravel, and so thick that in many places a number of trials will have to be made before a sounding rod can be thrust down without striking against them. Tree after tree, from 200 to 1,000 years old, may be found lying crossed one under the other, some partly decayed, as if they had died and remained standing a long time and then been broken down. Others had been blown down, and some had continued to grow for a long time after falling, as known by the heart being much above the center, and by the wood on the under side being hard and boxy.

The trees lie in all directions, as if fallen at different times, and their united ages, as shown where trees have grown since others have fallen, amounts to some thousands of years. The process of mining this timber is as follows: With an iron rod the swamp is sounded till it hits what is thought to be a good log. Its length and size is determined by the rod, as near as may be. A hole is dug with a sharp spade down to the log, and a chip obtained, which, by its smell, shows whether it was a windfall or a breakdown. If the former, it was probably sound when it fell and has since remained so. If thought worth working, the matted roots are cut away, the log is sawed off, and when loosened it at once floats in the water, which is always near the level of the swamp. Logs are sometimes worked, though rarely, to a length of thirty feet.

These logs come up with as much buoyancy as newly-fallen cedar, not being in the least water-logged, and the bark on the under side is quite fresh. The under side is always lightest, and turns up in rising to the surface. The workmen go over the same ground again and again, and find new logs each time, the lower logs probably rising in the mud when the roots over them are cut loose, and the logs which had laid on them are removed. These logs are found not only in the swamp, but also out in the salt marsh beyond the living timber, and are worked below present tide-level.

Most of this business is carried on in the neighborhood of Dennisville, and in some instances the industry has proved quite profitable. These facts may suggest research in other regions favorable to the preservation of timber in swamps, but where its presence in profitable quantities has not hitherto been suspected.[6]

"It is a curious fact," says Lee, in his "New Jersey as a Colony and as a State," "that, in spite of nearly 300 years of human occupancy by members of the Caucasian race, with all the vast influence of the contiguity of metropolitan centers, there are in forest, in lots of ten acres and upwards, 2,070,000 acres, with only 2,000,000 acres of improved lands in farms. The entire acreage of cleared upland amounts to 2,425,000 acres. Briefly it will be noticed that the forest area exceeds one-half of the acreage of improved farm land, due largely to the presence of vast afforested tracts in the coastal plain and the Appalachian zone."

[6]The above is chiefly derived from Professor George H. Cook's "Geology of New Jersey" (1868), pp. 354–361, where further details and several engravings are given, illustrating the mode of mining cedar timber. (See also "Scheyichbi and the Strand," by Edward S. Wheeler (1876), p. 111, and "Lyell's Second Visit to the United States," i., 34.) Mr. Wheeler states that between $9,000 and $10,000 worth of shingles, at $15 per thousand, have been made near Dennisville in a single year from this buried cedar. The larger logs are sometimes sawed into boards.

The original forests of New Jersey, however, have disappeared, except possibly from some of the most inaccessible ridges in the northwestern part of the State. There is, nevertheless, much valuable second-growth timber. According to the census of 1900, measurements made on the State map show that 43 percent of its area,or 3,234 square miles, is wooded. The area is said to be at least holding its own and the value of the forest to be increasing. The forests of New Jersey are insufficient to supply the wants of the population of the State, however, and nearly all it consumes is brought from beyond its limits. The forests of pine which once covered large portions of the southern counties have now generally been replaced by a stunted growth of oaks and other broad-leaved trees.

CHAPTER XXIX.

NEW JERSEY—LUMBERING AND STATISTICS.

It is more than probable that the Dutch and Swedes built and used sawmills before the English occupation. Of these, however, there are no definite records. The first sawmill of record was built at Woodbridge in 1682.[1] A year later the town admitted Jonathan Bishop as a freeman in consideration of his building a sawmill on the south branch of the Rahway River; in 1699 "Cortlandt's sawmill" is mentioned.[2] Several mills were in operation in and around Amboy in 1683. In proof of this Deputy Governor Thomas Rudyard is quoted. Mr. Rudyard in writing to a friend, "B. G.," in May, 1683,[3] said: "There are five or six saw-mills going up here this spring; two at work already, which abates the price of boards half in half; and all other timber for building; for altho' timber costs nothing, yet workmanship by hand, was London price, or near upon it, and sometimes more; which these mills abate; we buy oak and chestnut boards no cheaper than last year."

Stephen Wickes, in his "History of the Oranges," published in 1892, said the first sawmill was built in 1695. "It was on a stream near the town at the river. The next was on the Rahway River a short distance below South Orange in 1718. Samuel Harrison's sawmill was in operation in 1727, as appears by charges in his account book. How much earlier it is not known. It was built on Wigwam Brook, a few hundred yards west of Day Street. It continued in operation during most of the years of the last century.[4]

"Another sawmill, possibly as old as the last mentioned, was the Dodd mill; this was erected a short distance north of Dodd Street, near Glenwood Avenue, and was the last in use in this part of the town. It is impossible to state when or by whom this mill was erected, and it had been in the possession of and operated by the various members of the Dodd family certainly for more than 150 years before it was demolished in 1886. This old building occupied almost the position of the building now used for the Sewage Disposal Works of East Orange."

The Newark Town Records of June 19, 1695, contain the following: "Thomas Davis hath liberty to set up a Saw Mill to have the use of tim-

[1] "History of New Jersey," John O. Raum, 1877.
[2] "Woodbridge and Vicinity," Rev. Joseph W. Dally, 1873.
[3] "History of New Jersey," Samuel Smith, 1765.
[4] The dam which was built for the mill flooded the swamp west of it, and killed the thick growth of timber upon it.

bers in any common Lands, provided he shall let any of the Inhabitants have Boards as cheap as there is and before Strangers." This is supposed to have been the sawmill on Toney's Brook (the main tributary of Second River) on a site near the pond above the recent Wheeler's paper mill, in Montclair.[5]

Sawmills were erected at Little Egg Harbor in 1704 and at Pemberton on the North Branch of the Rancocas in 1758.[6] Professor Kalm, writing from Raccoon in April, 1749, said: "This morning I went down to Chester: In several places on the road are saw-mills; but those which I saw to-day had no more than one saw. I likewise perceived that the woods and forests of these parts had been very roughly treated. It is customary here, when they erect saw-mills, wind-mills, or iron-works, to lead the water a good way lower, in case the ground near a fall in the river is not convenient for building upon."

About 1760 Joseph Burr, Junior, of Northampton, Burlington County, erected a sawmill and dam on the south branch of Kancocas Creek, called Eyre's Mill Creek. He petitioned the Legislature, May 31, 1765, not to permit his rights to said mill and dam to be interfered with.

William H. Shaw in his "History of Essex and Hudson Counties," published in 1884, said:

The "memory of man runneth not" back to the time when the old mill on Canoe Brook, in the northern part of the township (Milburn) was built. The "oldest inhabitant" remembers it as Ezra Baldwin's sawmill. From him it passed to his son, Daniel Baldwin, and from him to his son-in-law, Abner D. Reeve, by whom it was rebuilt farther down the stream about thirty years since. After the death of Abner D. Reeve it was leased by a Mr. Hidden, who introduced machinery for the manufacture of leather boards. The experiment was a financial failure, and the mill was purchased by its present owner, George W. Reeve, the son of Abner D., who reconverted it into a sawmill.

In 1760, Messrs. Thomas Gould and Sanders built a grist mill on Pine Brook, on the old road leading to Westville, where the old tobacco factory stands. A sawmill owned by Gould and DeCamp antedated the grist mill by several years. In 1790 Zadoc Baldwin constructed a sawmill. . . .

In 1790, Noah Sayre, then a resident of Cedar Grove, formed a partnership with John Personette, of Verona, and engaged in the tanning and currying business. After a brief trial, which proved their business profitable, they added a mill for the grinding of bark and the sawing of lumber, and provided machinery for wood turning. Mr. Personette sold his interest to Mr. Sayre in the year 1820, who continued the business until 1830, when he retired. His milling property for a time went into decay. . . . The Marley sawmill was built early in this century by K. Perry. It is now owned by the Marley brothers, who have added machinery for hub-turning and who do a remunerative business.

Among the papers of the New Jersey Historical Society is a map of George Leslie's grant made by Samuel Willmott in 1751. It calls for

[5] "The Founders and Builders of the Oranges," Henry Whittemore, 1896.
[6] "History of New Jersey," John O. Raum, 1877.

1,187¼ acres in the town of Bedminster, Somerset County, and shows that at that date grist and saw mills were already standing on the west side of Peapack Brook. There is little doubt that these mills were erected by William Allen, according to Andrew J. Mellick, in "The Story of an Old Farm," 1889, in proof of which Mr. Mellick said:

On the twenty-first of January, 1750, the "major part of the executors of the last will and testament of Dr. John Johnstone, dec'd," conveyed to Thomas Claudenin, in consideration of twenty-eight pounds and eight shillings, eighteen acres of land, lying in the forks of the brook and of the north branch of the Raritan River. On the same day, and on the back of this instrument, Claudenin sends greeting, and gives notice "To all Christian People" that he has sold to "William Allen, his heirs and assigns forever, this present indenture and all messauges, lands, tenements, hereditaments to the same belonging." The consideration was "the sum of two hundred and twenty pounds, ten shillings, current money of New Jersey at eight shillings to the ounce." The wording of this transfer, together with the amount of consideration mentioned, would lead one to suppose that buildings of some kind—perhaps a saw and grist mill—had been erected; yet all traditions concur in naming William Allen as the person who first established mills in Bedminster township. He died in 1761, his will being dated on the twenty-third of May, and proved on the sixth of July of the same year. In it, these eighteen acres are devised as follows:

"I give, bequeath and devise unto my two sons, Robert and Joseph, the house I now live in, and the mill and lands whereon they stand, and all my other rights or improvements of the ninety-two acres adjoining to said mill lot, with all the farming utensils and the utensils for the mill now on the same, and all other my movable estate, to them and their heirs and assigns forever equally between their heirs or assigns forever."

The new owners had not been milling for many years before they discovered that Peapack Brook did not at all times contain sufficient water to supply the races that turned three mill wheels. They consequently conceived the idea of increasing the volume by diverting the water from the north branch of the Raritan. For the benefit of those unfamiliar with the locality, it would be well to explain that Peapack Brook, about a quarter of a mile above its mouth, runs for a considerable way parallel with and some 300 feet distant from the branch. These streams are separated by a long, narrow hill known as the "Hogback," and until within twenty years a highway climbed this ridge and ran along its spine, instead of following the bank of the larger stream as at present. At this point a dam was built which, checking the flow of the branch, created a reservoir. The hill was then tunneled, forming an aqueduct six feet high and three feet broad; it being constructed on an incline, a considerable quantity of additional water was, through it, led into the smaller stream, thus greatly augmenting the powers of the latter in serving the mills near its mouth. With the strange fatality that often attaches to local nomenclature in rural communities, this undertaking has always been known as the "Folly." It may have been because results secured were not considered commensurate with the outlay. There is no doubt that before the completion of the work, the Allens became financially embarassed and were forced, on the twenty-fifth of December, 1766, to convey the eighteen acres, together with the mills and buildings, to Stephen Hunt.

"The mill pond, now owned by Jonathan Elmer, was in 1748 owned by Ephraim Seeley, commonly called Colonel Seeley," says Lucius Q. C.

Elmer, in his "History of Cumberland County," published in 1869. "The mill stood in the low ground back of the house occupied by Mrs. DuBois, and the dam crossed above from the hill diagonally to the point where there is now a brick kiln. The old mansion house stood on the hill northwest of Mrs. DuBois, near the pond, and the road from the bridge over Cohansey, to the house and mill, ran about where the back part of Jonathan Elmer's house now stands. There was a bridge across the sawmill pond, back of the Methodist meetinghouse lot, over which the road to Fairfield passed, which was laid out as a public road in 1763. This road crossed Mill Creek near Fairton, at Joseph Ogden's mill dam, which was lower down the stream than the present dam.

"Seeley's mill was erected at an early date, but when and by whom has not been ascertained. . . . The straight road to Millville, now a turnpike, was laid out in 1805, commencing at the bridge; and in 1809 Jeremiah Buck erected the dam and flour and saw mills now standing, and it may be mentioned that Mr. French, the millwright, from near Bordentown, lost his life at the raising of the sawmill, having been crushed by falling timbers.

"Besides Seeley's mill and house, the old Hancock mill still remained in 1748. It was removed to a site just below the present stone bridge, and the existing raceway cut in 1772. This sawmill and the pond above, upon which the writer has often skated, remained until 1809, when Mr. Buck lowered the raceway and pond, as low as the tide would permit, to obtain a better head and fall at his mills above, and the mill was taken down. . . ."

In 1798 there were nearly 500 sawmills[7] in New Jersey. By 1905, however, this number had dwindled to sixty-six, according to a report by the Forest Service.

COST OF LUMBERING IN THE EIGHTEENTH CENTURY.

The *New Jersey Gazette*, dated March 21, 1785, contained an unique advertisement from which some idea of the lumber business in those days may be obtained. The advertisement estimated the cost of production from the forest to the yard. It stated also that there was a ready market at Trenton for boards and scantling. The advertisement follows:

To be sold, Nine thousand acres of land, situate on the river Lachawaxen [in Pennsylvania], about ten miles from Delaware River, and about one hundred miles from Trenton Landing, to which large boats and rafts do commonly run from Lachawaxen in two or three days. On this tract there is a great quantity of white and yellow pines of every size, from an eighty feet mast to the size of a spar; the pines are straight and thrifty, and are equal to any on the Delaware for masts, spars or boards. It is accommodated with four millseats, on which saw mills may be erected to great advantage—the whole tract may be properly divided into two equal parts, to each of which there

[7] "History of New Jersey," John O. Raum, 1877.

would be three hundred acres of excellent meadow ground, an hundred acres of which are cleared, and produces wild grass in abundance. From the mills, when built, rafts, from twenty to thirty thousand feet of boards in each, may be sent down these rivers to Philadelphia.

Time will be given for payment of part of the purchase money, and the remainder will be taken in loan-office certificates. Apply to Michael Millegas, Esquire, Reuben Haines or Richard Wells, in Philadelphia, or to the subscriber at Trenton.

The inland navigation of the Delaware has been so little attended to for several years past, that at present it is imperfectly known to many, who, if they were acquainted with its advantages, would sudenly reap profits that in future cannot be obtained without a great increase of capital; I have therefore subjoined an estimate of the expences for which a sawmill, with four saws, may be carried on on the above estate.

Cutting the logs	£ 026
Hauling do, for five years to keep four saws cutting 250 days in each year	050
The sawyer, the same that is generally given in the counties of Burlington and Gloucester	076
Manager's wages, and run occasionally	050
Rafting, and every contingent charged included, to Philadelphia, and delivering	100
	40s per m.

N. B. If the boards are delivered at Trenton-Landing, the expence of rafting will not exceed 12s 6d p. m.

I suppose four saws will cut 800 m. feet per annum, and that when delivered at Philadelphia they will sell for £6 per m.	4800
Deduct 40s per m. first cost	1600
	£3200
I allow in addition to this estimate, for accidents and charges arising from delays, per annum	500
Net profit gained per annum	£2700

In the foregoing estimate no notice is taken of profits arising from masts from sixty to seventy feet long, each stick proportioned; nor of the singular advantages gained by sawing deck-plank of forty-five feet long. They will, I believe, readily sell for thirty-five shillings per hundred feet; and if reduced to board measure, would be equal to seventeen shillings and sixpence per hundred; it is therefore evident, the deck-plank will produce a greater profit than boards—and they may be rafted with as little trouble, and more safety than masts or spars.

We find, at present, a ready market for boards and for scantling at Trenton, and if they are of the first quality, they will generally sell for six pounds per thousand; but when the permanent seat of Congress is fixed on the banks of the Delaware, may I not say that the demand for those articles will increase, and that the prices will rise in proportion to the demand?

Robert-Lettis Hooper, jun.

Trenton, January 27, 1785.

SALES OF EARLY SAWMILLS AND TIMBER.

The "New Jersey Archives" abound in references to sawmills in operation, and the advertising columns of newspapers were used freely in offer-

ing for sale sawmills, sawmill sites and timber adjacent to them. From these early records of the colony excerpts have been copied and are here reproduced. They are interesting in that they show how important the lumber industry of New Jersey was in the Eighteenth Century, and also because of the light they throw on the customs of the time, the kinds of timber most in demand, etc., and the many details they give as to places and people. Unfortunately nothing is said as to values, which evidently were not so well established as at the present time.

To be sold, a very good Tract of Land, containing 3314 Acres in the old Purchases, on the Head of the South Branch of Rarreton River, about six Miles from a Saw-Mill and Grist-Mill upon Black River, and near a Pond of Water called by the Indians Kant-Kan-i-auning, in the County of Hunterdon. It is well Timber'd and Water'd, and sundry Places upon it convenient to erect Mills.—*The American Weekly Mercury*, Feb. 12–19, 1739, 40.

Northampton Township, Burlington County, March 16, 1741, 2.—On the 27th Day of April next, . . . will be exposed to sale by Way of Public Vendue, at the Dwelling House of Philo Leeds, in the Township aforesaid; three Plantations and one Tract of Land, two Saw-mills, Lands and Tenements thereunto belonging, lying and being in Northampton aforesaid; as also some goods and Chattels hereafter mentioned, viz. . . .

One Saw-Mill, Lands and Tenements thereunto belonging, now in the Possession of Thomas Kemble.

One certain Saw, with one half the Saw-Mill, and Lands with the Tenements, lately built in Partnership with John Burr, to which new Saw-mill now belongs, a great Quantity of Timber and good Conveniences for Floating the Boards to Philadelphia. . . . —*The Pennsylvania Gazette*, March 25, 1742.

2600 Acres good Pine Land about 10 Miles from Gloucester with good Conveniency for Saw-Mills, about two Miles from Navigable Water.—*The American Weekly Mercury*, April 22–29, 1742.

To be Sold by the Executors of the Estate of Jonathan Wright, late of Burlington, . . . about eight hundred acres of choice Pine land, and two Pieces of Cedar Swamp, lying near Edge-Piltock Saw Mill in the county of Burlington.

Fifty acres of Land with a small Cedar Swamp lying at the Half way on the new Road from Burlington to Little Egg-Harbour, known by the name of Tom Roberts' Meadow. . . . —*The Pennsylvania Gazette*, Sept. 2, 1742.

. . . Also 288 Acres of good Cedar Swamp, scituate near the Head of Great Eggharbour River, in the County of Gloucester, on a fine Stream, being about 5 Miles from two Sawmills, and about 10 Miles from a Landing on Timber Creek, which is about 10 miles from the River Delaware, navigable for a Six Cord Flat, which said Swamp will either be sold altogether or divided into Lots.—*The Pennsylvania Gazette*, Jan. 4, 1742, 3.

To be Sold on Reasonable Terms . . . the herein after mentioned Saw-Mills, Tracts and Lotts of Land Situate in the County of Burlington aforesaid, Viz. . . .

One half part of a very good new Saw-Mill which works 2 Saws together, with one half the Land thereunto belonging, being well Timber'd with Ceader, Pine and Oak; . . .

One third part of a Saw-Mill with one Saw, and Land thereunto belonging, called Prickett's mill: . . .

One hundred Acres of Ceader Swamp, near Nathaniel Cripp's Saw Mill.

One third part of 5 Tracts of Ceader Swamp on the Westermost Branch of the waiding Run, near the head thereof. . . .

One half of 150 Acres of Ceader Swamp, and 300 acres of good pure Land near the Mill Place. . . . —*The Pennsylvania Gazette*, Jan. 11, 1742, 3.

A Plantation Scituate in the Township of Greenwich, in the county of Gloucester in New-Jersey, . . . also one half part of a New Saw-Mill, adjoining to said Plantation, with nine hundred Acres of good Pines within a Mile of the said Mill: likewise a likely young Negro Man, who understands Plantation or Saw-Mill business; to be Let with the said Plantation: . . . —*The Pennsylvania Gazette*, July 14, 1743.

To be Sold by Public Vendue, on the 13th day of November next,

A Tract of Land, containing 1400 Acres, lying in the County of Gloucester, at the Head of Timber Creek, it is well timber'd, and a good Stream runs thro' it, fit for a Sawmill. . . . —*The Pennsylvania Gazette*, October 18, 1744.

A Good Farm or Plantation at Middletown, in East-New-Jersey, . . . about 12 Miles from Amboy and 30 Miles from New York: There is also another tract of land adjoining . . . of about 200 acres, to be sold, . . . on which there is plenty of Timber and adjoining to a small Lot with a Saw-Mill belonging to the same Persons and which will be sold with the 200 Acre Tract. . . . —*The New York Gazette Revived in the Weekly Post Boy*, September 12, 1748.

In the county of Burlington, and Province of West New-Jersey, by the Subscribers; a very good Tract of Land containing Two Thousand Acres, of which One Hundred and Fifty is cleared in good Fence, . . . and is known by the Name of Dr. Dimsdale's Farm, situate within a Mile of Saw-Mills and Grist-Mills on each side . . . and bounded at each End on two fine Creeks both navigable, fit for small Craft to come up in order to carry any Sort of Produce, as Cord-wood, Ship-plank, and Staves, it being well timbered with fine large white Oak and other Timber fit for almost any Use this Country affords, and a very large Quantity of fine Swamp fit for making of Meadow, which may be cleared very cheap, for the Timber on most part of it will pay for clearing the Land. . . . —*The Pennsylvania Journal*, September 29, 1748.

A certain tract of land, containing three thousand three hundred & twenty-nine acres; . . . belonging to the estate of Edmond Kiff, . . . being well timbered, and convenient to a saw-mill:

Also another tract of land, formerly belonging to the said Kiff, containing nine hundred and sixty-nine acres, being also well timber'd, lying near Buckshutan cedar swamp, and convenient to a saw-mill.—*The Pennsylvania Gazette*, Feb. 14, 1748–9.

A Plantation lying upon South River, belonging to John Bainbridge, of Maidenhead; . . . Upon the East Side of the River there is a large Quantity of very good Pines, a good Stream to build a Saw-Mill on, also Saw-Mill Irons, about one Mile and a Half or two Miles from the said Tract, the Pines of about Three Hundred Acres of Land whereon they stand very thick. . . . —*The New York Gazette Revived in the Weekly Post Boy*, April 17, 1749.

Two thousand Acres of valuable Land, to be Sold very reasonable, lying at Greenwich, in the County of Sussex, in New Jersey, . . . 'tis well stored with Black Walnut and other valuable Timber, which may be transported down said River, in Boats or Rafts, to Trenton and Philadelphia; . . . there is a good Saw Mill built, and very good streams for more Mills to be built in sundry Places on said Land, . . . also 6 Acres of Land . . . with the half Part of a Saw Mill, Grist Mill, and Boulting Mill, and one Half of all the Utensils belonging to the said Mills, joining to said Land, upon Raway River five Miles from Elizabeth Town. . . . —*The New York Gazette* or the *Weekly Post Boy*, Jan. 28, 1754.

SEVERAL Tracts of Land, situate in the Township of Strafford, in the County of Monmouth, at a Place called Barnagat; to wit, one large Tract, containing between Six and Seven Thousand Acres . . . there are also several Swamps within the said Tract, abounding with Cedar, Pine, Oak, &c. . . . There is also to be SOLD, adjoining to the above Tract, and with or without the same, a good Saw-Mill, almost new, which goes with two Saws, and hath every Thing in compleat Order; the Pond is fed by living Springs, retains Plenty of Water in the driest Time, insomuch, that the Mill may keep constantly going, and Water to spare for other Uses. There are several Pieces of Cedar Swamp, and Parcels of Pine to be Sold with the said Mill for the Accommodation thereof, so that the mill will have Plenty of Timber for manyYears: . . . —*The New York Gazette* or the *Weekly Post Boy*, March 11, 1754.

To be Sold, by James Hepburn—A well going saw-mill, in the county of Monmouth, well accomodated with pine and cedar; . . it lies convenient for water carriage either to York or Philadelphia. . . . —*The Pennsylvania Gazette*, Aug. 29, 1754.

To be Sold, the following Tracts of Land, in New-Jersey, belonging to the Honorable Thomas Penn, and Richard Penn, Esqrs. proprietors of the Province of Pennsylvania, viz.:

Ten Thousand Acres at the head of Pawlins Kill, in Sussex County, well watered and timbered, . . .

Five Thousand Acres lower down the said Kill, stored with good Timber for Staves, Heading, and Plank, which is carried by Water from said Land to Philadelphia, some black Walnut Timber, very good Land and well Watered.

1250 Acres on Delaware at the mouth of Pequase River, as convenient a Place for Mills as any in New-Jersey, having both Saw-Mill and Grist-Mill already built. They bring their Black-Walnut and White-Pine Logs down Delaware by Water, and transport the Boards and Plank from the Mills to Trenton, and Philadelphia.—*The New York Gazette* or the *Weekly Post Boy*, August 18, 1755.

A Valuable tract of 1245 acres, situate partly in Sussex, and partly in Hunterdon county, in West New Jersey, the River Muskenetcong running thro' the middle thereof, about 45 miles from Brunswick, and 30 miles from Trenton, a grist mill and saw-mill contiguous thereto. . . . —*The Pennsylvania Gazette*, March 10, 1757.

To be sold by publick Vendue, . . . a Farm and Plantation whereon the said Robert Smith now dwells, containing 600 Acres, or thereabouts, about One Third whereof is cleared . . . and the Land uncleared is well timbered. . . . There will be likewise sold . . . one fourth Part of a Saw mill adjoining the same, together with one fourth part of a Cedar Swamp thereunto belonging. . . . —*The Pennsylvania Gazette*, March 9, 1758.

To be Sold—A Grist Mill, . . . with a Saw-Mill under the same Roof, with One Hundred or more Acres of Land; . . . situate in Shrewsbury, in the county of Monmouth, in New-Jersey, and known by the Name of Falls-Mills. . . . —*The New York Mercury*, May 28, 1759.

To be sold or lett for a Term of Years, a Saw-Mill, with several Lots of Cedar Swamp, lying in Little Egg Harbour, near the Forks, very commodious for Carting, with a constant Stream at the dryest Times. . . . —*The New York Mercury*, November 20, 1758.

To be Lett, for a Term of Years, a Plantation and Saw-mill, in Gloucester County New Jersey; . . . the Land well timbered and watered, and not above two Miles, to hawl Timber, &c, from the Mill to a good Landing. . . . —*The Pennsylvania Gazette*, February 10, 1763.

To be Sold or Lett, A Saw-mill, together with the Lands thereunto belonging,

lying on one of the South Branches of Little Egg-harbour River, within about 4 miles of a Landing, where the produce may be transported either to New York or Philadelphia. . . . —*The Pennsylvania Gazette*, November 10, 1763.

A Tract of Land, containing between 3 and 400 Acres, on George's Road, within three Miles of Brunswick, in Middlesex County, East New-Jersey; well timbered; with a fine constant Stream running through it, and a sufficient Fall for a Mill. Also another Tract, containing 3500 Acres of Pine Land, well timbered, with a fine stream for a Saw-mill; . . . —*The Pennsylvania Gazette*, December 22, 1763.

To be Sold, at Public Vendue, On Thursday the 14th day of June next, on the Premises:

All the Lands late the property of John Denniston, of the County of Middlesex, and Province of New-Jersey, deceased; . . . Lands are well timbered with Hickery and Oak, suitable to supply Brunswick or York markets, as it lies convenient for the same.—*The New York Mercury*, May 21, 1764.

Plantation and saw-mill, situated at Aucocus Brook (now written Hokokus), County of Bergen, and Eastern Division of the province of New Jersey, to be let or sold by Elizabeth Lane. . . . —*The New York Gazette*, February 28, 1763.

Exposed for sale by Samuel Tucker, Sheriff, estate and saw-mill of Charles Hoff, in Kingwood.—*The Pennsylvania Gazette*, July 19, 1764.

Exposed for sale by James Brooks, Sheriff, estate and saw-mill of Christopher Hogeland, in the township of Windsor.—*The Pennsylvania Gazette*, August 2, 1764.

Exposed for sale by Isaac Tuttle, plantation and saw-mill, in Hanover, Morris County.—*The New York Mercury*, November 5, 1764.

Exposed for sale by Andrew Reed of Trenton and Charles Pettit of Philadelphia, estate and saw-mill of Charles Hoff in Kingwood, county of Hunterdon.—*The Pennsylvania Journal*, Feb. 21, 1765.

Exposed for sale by Robert Friend Price, Sheriff, saw-mill of Vincent West, situated in Gloucester county, with 3,000 acres of pine land.—*The Pennsylvania Gazette*, May 16, 1765.

Exposed for sale by Samuel Tucker, Sheriff, 100 acres of land and saw-mill of John Mires, situated in Readingtown, on the northeasterly side of that fine stream called the South Branch of Rariton River.—*The Pennsylvania Gazette*, June 13, 1765.

Exposed for sale by Samuel Tucker, Sheriff, land and saw-mill of Hugh M'Cann, situated in Tewksbury on the river Alematunk.—*The Pennsylvania Gazette*, June 13, 1765.

Exposed for sale by Philip Kearny, land and saw-mill situated at Rocky Brook, Middlesex County, about 9 miles from Allen's Town.—*The Pennsylvania Gazette*, September 26, 1765.

Exposed for sale by David Ketcham, well timbered plantation and saw-mill, situated in East New Jersey, 5 miles from Monmouth Court House.—*The New York Mercury*, June 4, 1764.

Exposed for sale by Thomas Atkinson of Amwell and James Mc. Evers of New York, grist mill and saw-mill situated at Coryell's Ferry, 15 miles from Trenton, up the river Delaware. Saw-mill will cut a thousand feet a day; and logs may be had in plenty, at a reasonable rate.—*The New York Mercury*, August 20, 1764.

Exposed for sale or to let, by Manlon Wright, saw-mill situated in the township of Windsor, Middlesex County, on Barebrook, 5 miles from Princeton College.—*The Pennsylvania Gazette*, October 25, 1764.

Exposed for sale by Wilson Hunt of Maidenhead or Abraham Hunt of Trenton, grist mill and saw-mill, about 6 or 7 miles from Trenton Landing, on the same creek

with the Trenton mills, in a neighborhood abounding with oak, bilstead, and maple timber.—*The Pennsylvania Gazette*, January 31, 1765.

To let, by Priscilla Harrison on the premises and John Griffith near Gloucester, plantation and saw-mill in Greenwich township, Gloucester county, on the road from Gloucester to Salem; the land well furnished with white and black oak for sawing.—*The Pennsylvania Gazette*, December 9, 1762.

Exposed for sale by Samuel Ketchim, living on the premises, or Samuel Tucker of Trenton, plantation and saw-mill in Amwell, Hunterdon County, West Jersey.—*The Pennsylvania Gazette*, January 23, 1766.

Exposed for sale by Cornelius Swart, plantation of between 2 and 300 acres with saw-mill, in Middletown, East New-Jersey, Monmouth County, 160 acres cleared and the rest timbered with the best timber of all sorts, such as oak, bilstead, poplar, ash, nut.—*The New York Gazette* or *Weekly Post Boy*, Feb. 6, 1766.

Exposed for sale by Elizabeth Lane, plantation with saw-mill, at Aucocus Brook in the county of Bergen and eastern division of the province of New Jersey.—*The New York Journal* or *General Advertiser*, October 30, 1766.

Exposed for sale by William Bayard of New York, a farm, situated in the county of Bergin, about four miles from the town of Hackensack, with saw-mill on the noted stream called Saddle-river.—*The New York Mercury*, January 19, 1767.

Offered for sale by public vendue, saw-mill situated on Upper Bare Brook, in Windsor Township, Middlesex County.—*The Pennsylvania Gazette*, February 5, 1767.

Exposed for sale by John Range, saw-mill on the main branch of Raway River, distant from Newark and Elizabeth-Town 7 miles and Springfield one mile.—*The New York Mercury*, March 16, 1767.

Offered for sale by public vendue, a good saw-mill situate on Miry Run, in Great Egg-harbor township, together with 1670 acres of pine and oak land thereunto belonging.—*The New York Journal* or *General Advertiser*, June 18, 1767.

A Valuable tract of Land and marsh, situate in Gloucester county, New-Jersey, between Egg-Harbour and Tuckahoe rivers; containing in one tract about 1000 acres, . . . and a swamp that contains about 100 acres, . . . said swamp has in it a very large quantity of beach, white oak and sassafras timber, . . . likewise about 12 acres of cedar-swamp, . . . also about 100 acres of land and cedar swamp at the head of Tuckahoe, about 10 miles from above place, and about 5 miles from several saw-mills. . . . —*The Pennsylvania Gazette*, September 25, 1776.

A complete saw-mill, with two saws, on a very good stream of water, and about 5,000 acres of pine land, and 50 acres of cedar swamp with a good house, . . . the building, mill, mill-dam, all in good repair, with all the utensils fit for carrying on the same, with 2 log-houses for sawyers, and other out-buildings; situated on the main branch of Little Egg-harbour river. . . . —*The Pennsylvania Gazette*, February 12, 1777.

A Plantation or tract of Land, containing 300 Acres, or thereabouts, situated and lying in Hackett's Town, part in the county of Sussex and part in the county of Morris,[8] . . . There is also on said premises . . . a saw-mill joining to the other mills, a good frame dwelling house for a miller. . . . The mills are turned by the river Masconeteong.—*The Pennsylvania Packet*, March 4th, 1777.

To be Sold at Private Sale. . . . That valuable tract of land called Mount Penn,[9] in Monmouth county, East New-Jersey, . . . containing 1200 acres.

[8] Now in Warren County.

[9] Mount Penn was an elevation of sand and gravel, with a rich surface soil, situated near the old Province line, separating East and West Jersey.

. . . On the northerly end of the tract is a considerable quantity of Cedar swamp.[10] fit for cutting (the demand and price for this most valuable timber even from the northerly farmers in a short time, is now beyond conception) it is within 4 miles of a landing; . . . having grist and saw mills convenient; One other tract of woodland and marsh in Burlington County, . . . containing 130 acres, and which will make a genteel plantation, having a great plenty of oak and other timber on it, besides several lotts of marsh and upland. . . . —*The Pennsylvania Journal*, July 30, 1777.

EARLY LEGISLATION.

Governor Philip Carteret and his council in 1666 enacted rules and regulations governing the cutting of timber in and about the town of Elizabeth. This was found necessary owing to the depredations of timber pirates. The document was worded as follows:

Whereas, I am informed by way of complaint, from divers of the Inhabitants of this Town, that there are several persons that do presume to fell and cut down the best of timber trees in and about this Town, without any license or leave from those that are or may come to be the true owners thereof, converting them to their private advantage and profit, to the great destruction of timber for building, and the Lords Proprietors woods, to the great discouragement of all those that are already and that are to come to inhabit this Town. For the preventing thereof, and to avoid so great an inconveniency and destruction of this plantation, as may ensue by permitting such disorderly proceedings, I have thought fit and do by these presents, together with the advice of my Council, will and command, that no person or persons whatsoever, shall presume to cut down or fell any timber trees that are useful either for building, fences, or the making of pipe staves, in any home lots not properly belonging to themselves, nor within the compass of three miles of any home lot belonging to this Town, without license first obtained from the Governor, or leave from the owners of the land; upon the penalty of forfeiting the sum of Five Pounds sterl. for every such tree so fallen or cut down: *Provided*, that it may be and shall be lawful for any of the inhabitants of this Town to acquire their own lots, and other lots to plant upon, according to an Act made the 30th day of April last past, and in so doing it shall and may be lawful for any of them, to convert the wood and timber growing upon the same to their best use and advantage, and not otherwise. Given under my hand at Elizabeth Town, the 13th of June, 1666.

Ph Carterett,
James Bollen, John Ogden.[11]

As early as 1694 legislation was enacted by the mother country "for the better encouragement of builders of ships and other vessels within the province," expressly forbidding the exportation of any "timber, planks, boards, oak-poles, staves, heading, hoops or hop poles" excepting to some part "over the broad seas into the Kingdom of England, the West Indies or any of the Summer or Wine Islands directly, and there to unload the same." To prevent the infringement of this act inspectors were appointed

[10]From the cedar swamps in this vicinity large quantities of lumber were exported to the West Indies, during the colonial period, and there exchanged for rum and molasses.

[11]"East Jersey Records," III, 9, 10, E. T. Bill, p. 34. The act of Apr. 30 is not to be found. It was probably an act passed at a town meeting respecting the first and second divisions of land and other such matters, and so was recorded in the Town Book, A., unhappily lost or destroyed.

in all the towns. William Frost was charged with the duty within the bounds of Perth Amboy and Piscataway."[12]

William A. Whitehead[13] says there is no evidence of its having benefited those for whom it was professed to be framed, for it is doubtful if one vessel more was built than would have been without it. "At Amboy—which, being the chief city of commerce, should have been benefited by the law if any benefit resulted—we find it probable that no vessel was built until 1702. On the first of December of that year Miles Forster received a town lot 'in consideration of his having built the first sloop in Perth Amboy belonging to the province, and to be navigated hence.' "

The English Parliament passed an act in 1707 looking to the better preservation of pitch pine. It ordained that no person or persons within the colony of New Jersey should "presume to Cut, Fell or Destroy any Pitch-Pine trees, or Tar-Trees, not being within any Fence, or actual Inclosure, under the Growth of Twelve Inches Diameter, at three Foot from the Earth, on the Penalty or Forfeiture of Five Pounds for each offence; on Procf thereof to be made by one or more Credible Witnesses, on Oath before One or more Justice or Justices of the Peace, within or nearest to such Place where such Offence shall be committed; One Moiety of such Penalty or Forfeiture to be to her Majesty, Her Heirs and Successors, the other Moiety to the Informer or Informers."

One of the acts of the New Jersey Assembly in 1713 was to lay a duty of thirty shillings a thousand on pipe staves and twenty shillings a thousand on hogshead staves exported to any of the neighboring provinces.[14] This act was repealed in 1717, but in 1743 these duties, together with others, were revived and the law continued in force until the Revolution.

Early in 1729 there was a bill before the House of Commons "to prevent the felling or cutting down any pine trees—except such as are actually fenced—in the Plantations." Richard Partridge, Agent of the Province of New Jersey, petitioned the House against the measure in the following language:

> The Case of the Provinces of the Massachusetts-Bay, and New Jersey, and the Colonies of Connecticut and Rhode Island, and Providence Plantations, with respect to the Bill now in the honourable House of Commons, entitled, A Bill for Preservation of his Majesty's Woods in America, and for the Encouragement of the Importation of Naval Stores from thence, &c.
>
> It is proposed to be enacted by the said Bill, That no Person in His Majesty's Colonies in America, shall cut or fell any white Pine Trees, except only such as are the Property of private Persons, and growing within some Fence or actual Inclosure.
>
> To this it is humbly offered, for and on Behalf of the said Colonies, that their Lands are originally granted to the first Planters from the Crown, with all the Woods growing

[12] "East Jersey Records," pp. 172, 173.
[13] "Contributions to East Jersey History," 1856.
[14] "New Jersey Archives," Vol. XI, First Series, p. 37

thereon (as is expressly mentioned in their Charters or Patents), and without any Reservation whatsoever.

That the present Occupants claim under those Patents; and therefore humbly hope they have good Freeholds, and that to strip them there of, without giving them any Equivalent, would be a great Infringement of their Charters, and inconsistent with that Equity and Justice ever observ'd by this honourable House.

That if this Bill should pass into a Law, the Colonies will be no longer liable to supply his Majesty's Islands in America, as now they do with Pine-boards and Pine-timber, so necessary for their Houses and Sugar-works and other Occasions, which would very much hurt if not ruin those Islands.

And whereas there is an Exception for such Wood-lands as are within an actual Fence or Inclosure; this will be no Relief; because none of their Woods are so enclosed; it being not only needless, but the charge of erecting such Fences would amount to as much or more than the Value of the Woods so enclosed. . . .

The Pennsylvania Gazette commented in a lengthy editorial on this proposed legislation under the caption, "Observations in the Above Case." It said:

It is fundamental Rule in all Nations to promote and encourage their own Fabricks and Products, so as to require the least that is possible from other Nations of such Commodities as their Native Country (or Plantations) will produce. . . .

The Prohibition as to cutting or Felling any White Pine Trees in general, seems to be attended with still worse Consequences than that relating to Iron. . . .

It is to be observed, that those Countries abound chiefly in Pine-Trees and Oak, of which there are innumerable Quantities, sufficient not only to supply the Royal Navy; but moreover, for the furnishing of all the British Islands with Firr-Timber, and Boards for building their Houses and Fabricks for Sugar-Works, without which they could not subsist; and a very large Trade is continually carried on from New England to those Islands with the said Supplies, which employs a great Number of Men and Ships, and consequently promotes our navigation to a very great Degree.

Without all Dispute, a due Care ought to be taken for the Preservation of the King's Woods, with regard to such Trees as are necessary for Masting the Royal Navy; but at the same Time, the Inhabitants ought not to be debarr'd from making Use of such Trees as they want, either for their own Use, or for the Supply of the British Islands in America; or lastly, such Trees as are requisite, and might be imported to Great Britain, for our own Use; it being very plain and evident, that we have now vast annual Supplies, both of Fir-Timber and Boards, as well as Masts, from other Countries, at very dear Rates; and by the Bill now depending, instead of Encouragement for the Importation of them from our own Plantations, it totally defeats it.

The designed Provision in the Bill, which allows the Inhabitants to cut down Trees, that are within Fence or Inclosure, will be of very little or no Service, because the Charge and Expence of fencing the Lands, will be more than the Value of the Trees growing on them; and besides, whenever any Fences are made, 'tis done with those very Trees which they are now prohibited by the Bill from cutting down; so that if it should pass into a Law, it would be divesting them of their lands entirely.

This Bill seems intended, with regard to Pine-Trees, to supply the Deficiency of the Act relating thereto, passed in the 8th Year of the Reign of his late Majesty King GEORGE, in as much as it is said in the Bill, that large Tracts of Land have been, since the said Act, laid out into Townships only, with Intent to evade the Act, but instead of remedying that Evil, this Bill now extends to the whole Country: But in

Order to see how far the said Bill is consistent with Justice and Equity, it will be proper to examine how these Colonies came at first to be possessed, and upon what Terms they are now enjoyed.

The original possession of those Provinces was granted by Charter from K. James I. without any Reservation of Trees, which said Charter was vacated by a Decree in Chancery in K. Charles II.'s Reign; and afterwards a new Charter was granted by William and Mary, which is what they now enjoy; and in this last Charter the Inhabitants were expressly confirmed in all their private Properties, in the same manner as they before possessed them, only reserving to the Crown all white Pine-Trees of 24 Inches diameter and upwards, growing upon any Lands, not there to fore granted to any private Persons; so that all such Lands as were at that Time the Property of Private People, are now their indisputed Right, together with all Trees whatsoever, without any Reservation: Wherefore if the Legislature should now think it for the Interest of Great Britain, to deprive the Proprietors of their Trees, most certainly Satisfaction ought to be made to the Persons injured for what is taken from them. And it is to be observed, that in many of these Parts, the only Produce and Profits of the Lands are the Pine-Trees annually cut down and sold, and in lieu whereof, in a Course of Years, new Trees grow up, which is the case of all Pine-Grounds, if not otherwise manured or improved.

But in regard there are still very large Tracts of Land undisposed of, sufficient to furnish the Royal Navy with Masts, it is not to be presumed the honourable House of Commons will any ways injure, or take away the Properties of Private Persons, nor put them under the Burden of fencing their Wood-lands, which would be equal to taking them away.

Another Hardship in the Bill is, that for any Person importing Masts into Great Britain, to be intituled to the Bounty or Praemium, must produce a Certificate from the Surveyor of the Woods, or his Deputy; that they were cut with his Licence and Approbation; and altho' he is enjoined to give the said Certificate without Fee or Reward, yet 'tis putting it in his Power to dispute every Man's Title in the whole Country, which is a very great Latitude to be reposed in any one person; for that it, in a manner, makes him the sole Judge of all Properties, as far as the said Praemium or Bounty extends.—*The Pennsylvania Gazette*, the 17th of the 5th Month, 1729.[15]

Although working great hardship against the owners of timber in New Jersey the act was passed and went into effect September 29, 1729.

FOREST FIRES.

New Jersey has long been a great sufferer from forest fires and this in spite of legislation looking to the governing of same. As early as 1707 an act was passed which set forth "that no person or persons within the colony of New Jersey shall wittingly or willingly set fire to any Woods or Forest in which there are Pitch-Pine-Trees, or Tar-Trees, Prepared for the Making of Pitch or Tar, without first giving Notice to the Person or Persons, Owner or Owners of the said Trees, who had Prepared or Ordered the Preparing of such Trees; or to One of Her Majesties Justices of the Peace there, on Pain of Forfeiting of Ten Pounds for each offence, to be Recovered in such Manner, and on such Proof, and to be Distributed, as aforesaid; the said Forfeiture and Penalties to be Levied by Warrant, under the Hands and Seals of such Justice or Justices of the Peace."

[15] "New Jersey Archives," Vol. XI, First Series.

The extreme northwest, Blue Mountain, and a wide region of pine woods bounded on the north by Metedeconk Creek, south by Dennin's Creek, and west by the marl line, have been swept time and again by forest fires. In making his report on this section Mr. Hough[16] said:

This region extending to the coast, and comprising a million or more of acres, having been stripped of wood for charcoal, has repeatedly been the scene of destructive fires, increasing within the past few years in extent of damage, a single fire sometimes running over thousands of acres. In 1866 one swept over 10,000 acres; the burnt district reaching from Tuckerton to West Creek, a distance of seven miles westward. In 1870–71 nearly the whole wooded portion of Bass Township, Burlington County, was burnt over. In 1871 two fires in Ocean County burned over 30,000 acres, and the whole county is overrun about once in twenty years by fire. In 1872, owing to the long drouth in summer and autumn, fires were frequent in southern New Jersey, one in August burning from fifteen to twenty square miles, worth, before the fire, from $10 to $30, and after it from $2 to $4 per acre. These risks have reduced the salability of woodlands to a very great extent. These fires were formerly started generally from coalings on brush burning, but latterly for the most part by locomotives, which have done the greatest damage.[17]

On account of these fires so frequently running over this part of the State, there is but little large timber, although more than nine-tenths of the surface is wooded; and the residents are obliged to import nearly all the lumber required for use. Ship-building has been almost entirely abandoned, and the products of the forests may be said to be cord-wood and charcoal, instead of timber for construction and use in the arts. Worse than this, the vegetable mold in the soil is burned out, and the possibility of reproduction reduced to narrowest limits, or altogether prevented. Moreover, the climate has been injuriously affected, and drouths are much more common than formerly, owing to the dry and parched nature of the whole country thus stripped of its vegetable covering, and left as a "blackened desert."

In an article by Charles E. Elmer, of Bridgeton, New Jersey, in the report above cited, some facts and suggestions are given that are worthy of notice. He says:

The year 1872 is noted, the country over, for the extent and destruction of timber land by fires. True it is that the extent of burning was principally owing to the remarkably continued dry weather from early spring until early fall. I have endeavored to ascertain, measurably, the great loss by these frequent and destructive fires, but without success. To assert that 100,000 acres have been burnt over within the State of New Jersey, at a money loss in timber of $1,000,000 would surely be within the bounds of truth. These fires have been occasioned by the careless use (I say careless, when no consideration was given to the great drouth and the remarkably dry condition of the soil, and of all things lying thereon) of what is called firing to burn sedge upon old fields and brush upon new clearings. From these causes much waste of valuable timber has been made, the escape fire extending for many miles, when under ordinary circumstances it would have been limited to a few rods.

16"Report Upon Forestry," 1877.

17There is also a growing belief that some have been set by wood-choppers and charcoal burners to make business for themselves, in coaling the wood which otherwise would be allowed to remain for the more valuable lumber of older growths. In many cases it is not actual incendiarism, but carelessness, perhaps intentional, that in this way gives additional work to these people.—Report of the New Jersey State Board of Agriculture, 1874, i, 60, from which most of the above facts have been derived.

The forest fires which swept over southern New Jersey in 1880 consumed nearly $1,000,000 worth of timber. In one county 125,000 acres of woodland were ravaged by flames at a cost to property owners of $750,000.[18] A cedar swamp, which had just been appraised at $150,000, was converted into worthless ashes. Cedar, pine and hop pole timber, cranberry bogs, huckleberry fields and vineyards constituted a large portion of the taxable property of southern New Jersey. During three weeks of May relentless conflagrations wantonly raged through this vast expanse of natural wealth. The commercial aspects of this calamity were such that trade in these commodities was paralyzed for years, for the devastated acres are worthless until covered with a new growth of marketable timber.

NEW JERSEY LUMBERMEN'S PROTECTIVE ASSOCIATION.

From long established custom between the manufacturer, the wholesaler and their representatives with the retail dealers during the years between 1880 and 1884 a gradual encroachment upon the retail dealers' business began to take place. This evil, for such it became, was sapping the vitality of the trade and if allowed to go unchecked little or nothing would be left in the way of profitable business for the dealer engaged in the retail branch.

The cause of the trouble was directly traceable to the ambition of certain overzealous salesmen, who, not satisfied with the orders placed with them by dealers, sought out the dealers' customers and made sales direct at prices similar to or at a fractional advance over the price given to the dealer. This inroad upon the trade did not increase the consumption of lumber, but it piled up a stock of material in the yards for which there was no market, as the duplicate supply sold direct to the contractor supplied the demand.

A group of men engaged in the retail lumber business in Newark, after a social gathering, discussed this trouble and they realized that individual effort would not check it, and therefore resolved to organize an association to check the spread of this practice.

If it had been confined to the State of New Jersey only their efforts would have been successful, but, like the seed of the weed carried by the wind, this practice of selling to consumers was carried into all fields of activity.

An organization was effected on March 11, 1885, with Joel W. Hatt, of Newark, president; A. D. Cook, of Bound Brook, vice president, and Col. J. S. H. Clark, of Newark, secretary.

Commencing with eighteen dealers, it soon attracted all of the principal dealers in the State, who had their names enrolled, and the object

[18] *Northwestern Lumberman*, June 18, 1880.

was at once recognized by retail lumbermen in various states as being the only remedy for the trouble.

Through the efforts of the New Jersey dealers, associations were formed in Connecticut, New York and Pennsylvania, and, subsequently, the entire lumber trade throughout the United States organized along similar lines and for similar purposes.

The New Jersey Association is the pioneer among all and showed the way; it has sustained its foremost position as an advocate of reforms in the trade and of equitable and fair dealings not only between the wholesale and retail branches but between neighboring dealers.

The much talked of, much discussed and much abused agreement, known as the Boston agreement, was proposed by Secretary James M. Reilly in a report of the board of directors of the Association as a medium for coöperation between the wholesaler and the retailer.

This original agreement held the solution of all the trouble growing out of so-termed irregular shipments by wholesalers to consumers, but unfortunately, to nullify its provisions, a clause was insisted upon and inserted providing for a plan of arbitration under which nothing but discord, strife and ill-feeling was produced. This situation became so serious and the relations between the wholesale and retail interests were strained to such a point that it became necessary to find a medium whereby a good footing might be arranged on which the differences could be discussed and adjusted.

Again the New Jersey Association took the initiative and as a result a new association of associations was born, which became known as the Eastern States Retail Lumber Dealers' Association, in which the interests of the members comprising the several state and local associations in the eastern middle states were combined.

This Association became powerful at once, acting under original rules and regulations, voicing as a unit the combined opinions and wishes of its constituent members, thus doing away with each separate association advancing its own plan, frequently clashing with the plan or plans of affiliated bodies.

The New Jersey Association also took up the issue with commercial agencies and secured the adoption of distinct character marks to denote the retail dealer from the carpenter contractor. It has also put up a strenuous opposition to all credit reporting companies or agencies against a classification of carpenter contractors, and during the twenty-two years that it has existed it has borne the brunt and forced the real fight for the establishment of a code of ethics in the trade, which code recognized the right of the manufacturer and wholesaler equally with that of the retailer, but the golden rule laid down to govern was that wholesale dealers or

manufacturers should not become active competitors with their own customers, that an unfair advantage to one contractor was unfair to his competitors, and that the only legitimate and proper rule of trade should be that all lumber to be used by consumers should be secured through the local retail dealer.

The officers of the Association for 1907 were: William W. Smalley, of Bound Brook, president; Sidney S. Thompson, of Elizabeth, treasurer, and James M. Reilly, of Newark, secretary.

The burden of its work today is to secure coöperation from all organizations of manufacturers and wholesalers in preventing the poaching retailer from making further inroads upon the profitable side of the business, through an arrangement whereby it will be impossible for this class to place orders with reputable concerns for delivery to consumers outside of the point at which the dealer conducts his business.

The selling of lumber in carload lots by retail dealers on a percentage or commission basis is conceived to be distinctly an injustice to the wholesale dealers and manufacturers; and the Association has resolved to put a stop to it and, if need be, to force such dealers out of the business, holding them to be parasites on the trade and their methods without justification. Thus, while the New Jersey Lumbermen's Protective Association is composed of retail lumbermen and was organized primarily in their interest, it has endeavored to formulate and put into effect an equitable reciprocity between the wholesale and retail branches of the trade by which each will be protected in the exercise of what is believed to be its proper functions. This Association was one of the first to realize that its members as retailers could not secure protection in their business by the manufacturers and wholesalers without, in return, extending protection against encroachment on the legitimate trade of the wholesalers; and this Association has probably gone farther in this direction than any other in the country.

LUMBER STATISTICS.

A comparison of the principal items making up the census reports for the years 1850 to 1900, inclusive, will be found in the following table:

COMPARATIVE LUMBER STATISTICS. 1850–1900—NEW JERSEY.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments	324	268	285	284	114	205
Capital	$928,500	$1,163,100	$2,238,900	$1,657,395	$1,557,508	$1,477,930
Number of wage-earners	665	591	1,145	768	641	978
Wages	$177,180	$188,752	$369,835	$179,693	$201,751	$409,282
Cost of materials used	$646,209	$942,706	$1,612,802	$989,979	$695,987	$830,655
Value of products	$1,123,052	$1,623,160	$2,745,317	$1,627,640	$1,225,766	$1,859,014

[1]Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

The subjoined table shows the quantity and value of forest products, as given in the twelfth census, including rough lumber, shingles, other sawed products and timber camp products, giving a total value of $1,791,101. It represents the calendar year 1899.

FOREST PRODUCTS OF NEW JERSEY—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
Yellow pine	26,712,000	$381,053
White pine	1,700,000	22,500
Hemlock	996,000	12,600
Spruce	1,000,000	20,000
Cypress	3,000	90
Cedar	10,378,000	156,069
Total, conifers	40,789,000	$592,312
HARDWOODS:		
Ash	11,000	$ 340
Chestnut	10,418,000	163,895
Cottonwood	260,000	2,600
Elm	22,000	250
Gum	156,000	2,383
Hickory	859,000	20,660
Oak	19,178,000	395,834
Poplar	665,000	9,875
Black walnut	69,000	2,280
Maple	100,000	2,000
Other hardwoods	133,000	2,980
Total, hardwoods	31,871,000	$603,097
Total, rough lumber	72,660,000	$1,195,409

SHINGLES.

	Quantity, pieces.	Value.
Yellow pine	582,000	$ 3,105
Cedar	32,448,000	138,346
Hemlock	275,000	1,100
All hardwoods	530,000	3,680
Total, shingles	33,835,000	$146,231

OTHER SAWED PRODUCTS.

	Quantity.	Value.
Furniture stock, feet b. m.	99,000	$ 1,815
Agricultural implement stock, feet b. m.	10,000	400
Carriage and wagon stock, feet b. m.	821,000	30,338
Pickets and palings, feet b. m.	523,000	5,336
Lath, pieces	3,559,000	12,342
All other sawed products	.....	106,725
Total, other sawed products	.....	$156,956

TIMBER CAMP PRODUCTS.

Basket stock, cords	656	$ 2,330
Excelsior stock, cords	50	50
Fence posts, pieces	17,800	2,250
Hop poles, pieces	12,500	150
Logs cut for domestic sale, feet b. m.	2,785	19,778
Handle stock, cords	100	720
Piles, pieces	6,460	23,478
Railway ties, pieces	64,108	26,853
Ship knees, pieces	50	36
Telegraph poles, pieces	11,938	42,221
Wheel stock, cords	105	610
Charcoal, bushels	13,400	1,405
All other products	.....	23,086
Amount received for contract work	.....	16,245
Total, timber camp products	.....	$159,212
Total, planing mill products	$423,788	
Less value of lumber used	290,495	$133,293
Grand total, value forest products	.....	$1,791,101

It will be found that the figures for 1899 in the following comparative summary of the lumber and timber products of New Jersey for the years 1899 and 1904 do not agree with the figures for the same items in the preceding table. This disagreement is accounted for by the fact that in the census of 1905 the custom mills were not taken into account, and, in order to make the comparison perfect, these mills were deducted from the 1900 figures also, in this table:

CENSUS OF MANUFACTURES.
LUMBER AND TIMBER PRODUCTS—NEW JERSEY.
Comparative Summary—1900 and 1905.

	1900.	1905.
Number of establishments	127	[1]114
Capital	$1,045,197	[1]$825,375
Salaried officials, clerks, etc.:		
Number	32	[1]8
Salaries	$23,384	[1]4,248
Wage-earners:		
Average number	1,021	[1]900
Wages	$407,268	[1]$387,960
Miscellaneous expenses	$85,162	$135,070
Cost of materials used[2]	$800,104	[1]$357,378
Value of products[2]	$1,755,115	[1]$1,160,651
Quantity, Value and Principal Varieties of Rough Lumber:		
Yellow pine:		
Thousand feet b. m	22,627	11,381
Value	$330,518	$141,780
Hemlock:		
Thousand feet b. m	796	785
Value	$10,100	$10,161
Cedar:		
Thousand feet b. m	8,010	8,411
Value	$121,564	$133,400
Chestnut:		
Thousand feet b. m	8,572	8,679
Value	$129,985	$136,543
Hickory:		
Thousand feet b. m	839	2,099
Value	$20,260	$68,760
Oak:		
Thousand feet b. m	15,888	12,034
Value	$337,947	$282,931
Maple:		
Thousand feet b. m	100	216
Value	$2,000	$4,775
All other:		
Thousand feet b. m	5,222	453
Value	$96,527	$9,724
Total quantity, thousand feet b. m	62,054	44,058
Total value	$1,048,901	$788,074

[1]Decrease.
[2]Includes a duplication—the value of rough lumber, which in 1905 amounted to $43,767, remanufactured in planing mills connected with sawmills producing it.

The lumber product of the United States for 1906 was made the subject of a special report by the Census Bureau in coöperation with the Forest Service. This report related to quantities of different classes of lumber products, but not to values. According to this report the product of New Jersey was nearly 19 percent less than in 1904. The lumber product of this State has declined to a point where it is hardly worth consideration as a factor in the supply of lumber to the general markets of the country, but for so small a state it has been a prolific lumber producer, and will always find a considerable portion of its area better adapted to tree

growing than to any other use. The production by woods in 1906 was as follows:

Kind.	Feet.	Kind.	Feet.
Yellow pine	12,963,000	Basswood	414,000
White pine	687,000	Cedar	2,084,000
Hemlock	1,498,000	Birch	185,000
Oak	9,325,000	Beech	351,000
Spruce	356,000	Elm	94,000
Maple	461,000	Ash	115,000
Poplar	100,000	Hickory	1,199,000
Red gum	293,000	Walnut	6,000
Chestnut	6,122,000	Total	36,253,000
Lath		13,004,000 pieces.	
Shingles		22,297,000 "	

FOREIGN TRADE.

During the last half century New Jersey has figured very lightly in the foreign trade. In early times her imports and exports were of some relative importance, but now the New York customs district has absorbed practically all of this business. The result has been that during the entire period from 1856 to 1905, inclusive, the business done has not equaled a single day's importations at New York so far as forest products are concerned. The following table shows the total business done by the customs districts of New Jersey during the period named:

VALUE OF EXPORTS AND IMPORTS, BY CUSTOMS DISTRICTS, 1856–1905.

EXPORTS.

District.	Sawed lumber.	All other unmanufactured.	Cabinet ware and furniture.	All other manufactures.
Newark	$ 8,382	.....	$40	$ 610
Perth Amboy	42,348	$127,560	.....	18,181

IMPORTS.

Great Egg Harbor	.....	$ 3,799	.....	$ 73
Newark	$32,201	401,249	$7,246	23,647
Perth Amboy	1,705	40,172	.....	10,379

CHAPTER XXX.

PENNSYLVANIA—EARLY HISTORY.

The "Keystone State" (so called because of its position in the arch representing the thirteen original states) has always occupied a prominent place in the lumber industry. In 1850 it was surpassed in value of product by only one state—New York—and in 1860 it stood at the very top. In 1870 and 1880 Michigan alone exceeded it; in 1890 Michigan and Wisconsin had a larger production, and in 1900 Pennsylvania ranked fourth, with Michigan, Wisconsin and Minnesota above it.

Originally, this State was a dense forest. Pine and hemlock occupied the higher portions of the Alleghenies, with hardwoods in increasing quantities as the slope decreases to the west. In the southeast, beyond the mountains, hardwoods were found almost exclusively. After more than 200 years of lumbering this vast wooded area has been reduced about one-half, leaving 51 percent, or about 23,000 square miles, wooded. From this remaining forested area the greater part of the merchantable timber has been cut, especially the white pine; but even this has not been exhausted entirely, as the 1900 census showed a cut of this species of over 221,000,000 feet board measure, and in 1906 it was 96,564,000 feet.

Before William Penn had ever set foot in his newly acquired territory in America he made provision for the protection of the timber thereon. In an instrument made by himself in England, July 11, 1681, and called "conditions or concessions" between him and the "adventurers and purchasers" in Pennsylvania, and which was a sort of compact as to landed settlements and the government of the colony, the following reference to the conservation of the timber supply is found:

XVIII. That in clearing the ground, care be taken to leave one acre of trees for every five acres cleared; especially to preserve oak and mulberries for silk and shipping.

It is not known to what extent this order was observed, but it is more than likely, in view of the general disregard similar instructions in other colonies received, that very little, if any, attention was paid to it.

EARLY SETTLEMENTS.

Pennsylvania occupies an area of 45,928 square miles, or 29,393,920 acres, of which 1,249 square miles is water surface. The present area of the State is somewhat less than the original charter outlined, but even this reduced area was long and bitterly contested for. Pennsylvania, like all the other tracts in the New World given by Royal charter to companies

and favored individuals, had the same portions of her territory deeded away to several different subjects of the King, each one of whom was determined to maintain possession of every inch that could possibly be construed as included in his charter. The boundaries of Pennsylvania, unlike those of many of the early grants, were definitely stated in its charter; nevertheless, New York, Maryland, Connecticut and Virginia each claimed a part of the original grant made to William Penn, and not until about 1800 was the last claim settled definitely.

The earliest settlement in the original tract of Pennsylvania was made in what is now Delaware, by the Swedes, in 1637. The Dutch had explored the Delaware years previous; but their object was trading, not colonization. Henry Hudson, in his *Half Moon*, had entered Delaware Bay in 1609; a Dutch navigator, Cornelius May, explored the bay and river in 1616, giving to one of the two capes at the entrance of the bay his own name, May, and to the other Hindlopen, now called Henlopen; the Dutch West India Company formally took possession of "South River" (the Delaware) in 1623, erected Fort Nassau at the present Gloucester, New Jersey, and, later, Fort Beversrede, on the Schuylkill. But it was the Swedes, under the patronage of the Swedish West India Company, who made the first permanent settlement on the Delaware River, in 1637, where the city of Wilmington now stands, and erected a fort. They bought from the Indians all the territory extending from Cape Henlopen to "the great falls of the Delaware" (at Trenton), and in 1643 erected a post and fort at Tinicum Island, in the Delaware below Philadelphia. This settlement was made by Colonel John Printz, a Swedish military officer of note, and a few Swedish adventurers, and was the first European settlement, in what is now Pennsylvania, of which there is any authentic record. The fort was made of logs and the settlement was named New Göteborg. The Dutch had a settlement at what is now Shawnee, Monroe County, above the Delaware Water Gap, which is supposed to have been made years previous to Penn's arrival, and is thought by some to have been the first settlement within the present boundaries of Pennsylvania. This supposition does not seem well founded, however. Upland (changed by Penn, upon his arrival, to Chester, as it has been known ever since) was settled in 1648.

There was a long dispute between the Swedish and the Dutch settlers, the latter claiming the Delaware River territory and having erected Fort Nassau on the eastern bank of the river, also Fort Casimir near where New Castle, Delaware, now stands. In 1648 they attempted to establish a trading post on the Schuylkill, but were prevented by the Swedes. In 1655 the Dutch, under Peter Stuyvesant, captured the Swedish settlements, and the Dutch were later, in 1664, brought under the English

rule by the Duke of York until 1681 (with the exception of a brief supremacy of the Dutch in 1673–4), when the Delaware River settlements were granted in King Charles' charter to Penn, which will be discussed later.

NEW ALBION.

A grant that antedated Penn's by nearly a half century included what is now Pennsylvania. King Charles I, in 1634, granted to Sir Edmund Plowden and eight others the whole of Long Island and a generous portion of the adjacent continent. This domain was made a county palatine and called New Albion, the island being named Isle Plowden. The boundaries of New Albion included all of New Jersey, Maryland, Delaware and Pennsylvania embraced in a square, the eastern side of which, forty leagues in length, reached from Sandy Hook to Cape May, together with Long Island and all other "islands in the sea within ten leagues of the shores of the said region."

CONNECTICUT'S SETTLEMENTS.

Some of the leading colonists of New Haven, Connecticut, in order to engage in the fur trade then advantageously carried on by the Dutch and Swedes on Delaware Bay, formed a "Delaware Company," and late in 1640 sent a vessel into Delaware Bay, commanded by Captain Turner. He was instructed to buy lands, but not to interfere with any claims of the Swedes or Dutch. But he paid no heed to boundaries, buying from the natives nearly the entire southwestern coast of New Jersey (as related in Chapter XXVIII of this work), also a tract at Passayunk, on the present site of Philadelphia and opposite the Dutch fort Nassau.

This attempt at colonization was unsuccessful and in 1643 the majority of the settlers went back to New Haven. But the town from whence they came still claimed as its own this purchased territory and several other attempts were made to settle it. Connecticut continued to be a thorn in the flesh to Pennsylvania in her persistence in claiming territory in the latter's domains until the close of the Eighteenth Century.

With this brief summary of the early settlements and conflicting claims to Delaware River lands, we come to the great founder of a great commonwealth—William Penn. The story of his first interest in New World lands, after his settlement of the dispute between the two Quakers, John Fenwick and Edward Byllinge, regarding claims in New Jersey, is related in the first chapter devoted to that State and is referred to again in this place because it may have been an influence in drawing Penn's attention forcibly to the New World and thus may have led up to his greater acquisition later of the territory that still bears his name.

PENN'S CHARTER.

William Penn inherited from his father a claim of £16,000 against the Crown. In 1680 he requested Charles II to make payment of this claim

in lands in America, which request was readily granted. Regarding the naming of the tract, Penn himself wrote to his friend, Robert Turner, under date of January 5, 1681:

This day my country was confirmed to me under the great seal of England, with large powers and privileges, by the name of Pennsylvania, a name the king would give it, in honour of my father. I chose New Wales, being, as this, a pretty hilly country, but Penn being Welsh for *a head*, as Penmanmoire, in Wales, and Penrith, in Cumberland, and Penn, in Buckinghamshire, the highest land in England, called this Pennsylvania, which is, *the high* or *head woodlands;* for I proposed, when the secretary, a Welshman, refused to have it called New Wales, *Sylvania*, and they added *Penn* to it, and though I much opposed it, and went to the king to have it struck out and altered, he said it was passed, and would take it upon him; nor could twenty guineas move the under-secretaries to vary the name, for I feared lest it should be looked on as a vanity in me, and not as a respect in the king, as it truly was, to my father, whom he often mentions with praise.

The King's charter to Penn was signed on March 4, 1681. "This venerable document, which is in the office of the Secretary of the Commonwealth, is written on strong parchment, in the old English handwriting, with each line underscored with lines of red ink, that give it a curious appearance. The borders are gorgeously furbelowed with heraldic devices, and the top of the first page exhibits a finely executed likeness of His Majesty, in good preservation."[1] An extract from the charter, preserving the old spelling and punctuation, is as follows:[2]

CHARLES the Second [etc.] . . . WHEREAS Our Trustie and well-beloved Subject, WILLIAM PENN, Esquire, Sonn and heire of Sir WILLIAM PENN, deceased, out of a commendable Desire to enlarge our *English* Empire, and promote such usefull comodities as may bee of Benefit to us and Our Dominions, as also to reduce the savage Natives by gentle and just manners to the Love of Civil Societie and Christian Religion, hath humbley besought Leave of Us to transport an ample Colonie unto a certaine Countrey hereinafter described, in the Partes of *America* not yet cultivated and planted; And hath likewise humbley besought Our Royall Majestie to Give, Grant, and confirme all the said Countrey, with certaine Privileges and Jurisdictions, requisite for the good Government and Safetie of the said Countrey and Colonie, to him and his Heires forever. KNOW YE THEREFORE, That Wee, favouring the Petition and good Purpose of the said *William Penn*, and haveing Regard to the Memorie and Meritts of his late Father in divers Services, and perticulerly to his Conduct, Courage, and Discretion under our Dearest Brother, *JAMES*, Duke of *York*, in that Signall Battell and Victorie fought and obteyned against the *Dutch* Fleete, comand by the Herr *Van Opdam*, in the yeare One thousand six hundred and sixty-five: In consideration thereof, of our Special grace, certaine Knowledge, and meere Motion have Given and Granted, and by this Our present Charter, for Us, Our Heires and Successors, Doe give and Grant unto the said *William Penn*, his Heires and Assignes, all that Tract or Parte of Land in *America*, with all the Islands therein conteyned, as the same is bounded on the East by *Delaware* River, from twelve miles distance Northwards of *New Castle* Towne unto the three and fortieth degree of Northerne Latitude, if the said River doeth extende so farre North-

[1]Dunlop, in "Memoirs of Pennsylvania Historical Society," Vol. I, p. 164.
[2]This extract is from "Charters and Constitutions," Part 2, Government Printing Office, 1877. The charter is given in full (though in modern English) in S. Hazard's "Annals of Pennsylvania."

wards; But if the said River shall not extend soe farre Northward, then by the said River soe farr as it doth extend; and from the head of the said River, the Easterne Bounds are to bee determined by a Meridian Line, to bee drawne from the head of the said River, unto the said three and fortieth Degree. The said Lands to extend westwards five degrees in longitude, to bee computed from the said Easterne Bounds; and the said Lands to bee bounded on the North, by the beginning of the three and fortieth degree of Northern Latitude, and on the South by a Circle drawne at twelve miles distance from *New Castle* Northward and Westward unto the beginning of the fortieth degree of Northern Latitude, and then by a streight Line Westward to the Limitt of Longitude above-mentioned. . . . And of Our further grace, certaine Knowledge, and meere Motion, we have thought fitt to erect, and we doe hereby erect the aforesaid Countrey and Islands into a Province and Seigniorie, and doe call itt Pensilvania, and soe from henceforth we will have itt called.

The southeast corner of Pennsylvania, cut off by the circular line defined in the above excerpt from the charter, was disposed of in the manner indicated to satisfy the Duke of York, who claimed the three counties now comprising Delaware by right of conquest (referred to before) and had annexed this section to his possessions in New York. But Maryland also claimed the Delaware territory by right of the charter to Lord Baltimore, although the Dutch had succeeded in holding it against Maryland until wrested from them by the Duke of York. However, the Duke of York was persuaded to give up this claim to Penn, which incident is disposed of farther on.

By the Royal charter William Penn was made governor and proprietor of a large tract intended to be three degrees in width and five degrees in length; he had power to sell the land at such prices and to whom he pleased; he could make the laws (subject to the assent of the freemen), appoint magistrates and judges, levy taxes, control the military forces and grant pardons, the Crown reserving the right of veto in all these powers.

After receiving his patent Penn at once sent out his cousin, Captain William Markham, to explore the Delaware and select the best site for a city. Then he sent a surveyor general, Thomas Holme, and several other commissioners. Penn himself sailed for his new acquisitions in the ship *Welcome* on September 1, 1682, arriving at New Castle (now Delaware) on October 27. The following day he addressed the people, telling them of his ambition to found a free and virtuous state where the people should govern themselves. He said every man in his provinces should have full liberty of conscience and his rightful share of political power.

NEW YORK AND MARYLAND RELINQUISH DELAWARE.

On this same day, James, Duke of York, gave up his claim to the counties of New Castle, Kent and Sussex. The following account[3] describes the event, and also the settlement of Maryland's claims to Delaware:

[3]From "The Public Domain," by Thomas Donaldson, published by the United States Government, 1884.

The counties of New Castle, Kent and Sussex upon the Delaware were granted by James, Duke of York, by two quit-claim deeds or deeds of feoffment, of date August 24, 1682, to William Penn, proprietary of Pennsylvania.

October 28, 1682 (O. S.), at the courthouse in New Castle, in the midst of the people, Penn received from the agent of the Duke of York the surrender of the territory which is now the State of Delaware, receiving it by the solemn delivery of earth and water. As the territory thus transferred lay within the limits claimed by Maryland, James II [in 1685] ordered that that portion of the peninsula lying between the fortieth parallel and the parallel of Cape Henlopen should be equally divided between the two colonies. By the agreement made in 1732 between the heirs of Penn and Baltimore, and which was based upon the decision of the committee of trade and plantations in England, before whom Baltimore and Penn were, December 9, 1685, wherein it was decided that Delaware did not constitute a part or portion of Maryland, it was agreed that from the middle point of the parallel of Henlopen a tangent be drawn to the circle around New Castle, and made the line of separate jurisdiction. This tangent was continued northward to a point fifteen miles south of Philadelphia, through which Mason and Dixon's line was subsequently run.

MASON AND DIXON'S LINE.

Lord Baltimore had also claimed not only Delaware but that portion of Pennsylvania south of the fortieth parallel of latitude. Geographers of that time considered degrees of latitude as zones taking their designation from the northern parallel; therefore, the beginning of the forty-third degree, Pennsylvania's northern boundary, would be the forty-second parallel, and the beginning of the fortieth degree, Pennsylvania's southern boundary, would be the thirty-ninth degree. In their disputes Penn contended for the meaning as generally accepted at that time, while Lord Baltimore took the other meaning. The final settlement of the dispute (many years after the original contestants had both been laid in their graves) is thus concisely given in "The Public Domain":

In the disputes on boundary with Penn, Baltimore contended for the modern meaning of the word latitude, which would carry his grant to the fortieth parallel. The line between them by the grants to the colonies respectively, had been fixed at the fortieth parallel north latitude. By an agreement between the proprietaries for fixing their boundary, commissioners were appointed for that purpose, in 1732, 1739 and 1750. None of them could agree, and suits in chancery followed. On the 15th of May, 1750, the lord chancellor, Hardwick, rendered a decision which was the basis of a stipulation and adjudication, signed July 4, 1760. Under this, after November, 1760, three commissioners and surveyors were appointed, and spent three years in locating base and tangent lines between Delaware and Maryland. Charles Mason, F. R. S., assistant to Doctor Bradley, the astronomer of the Royal observatory at Greenwich, and Jeremiah Dixon, in 1763, were commissioned by the proprietaries of Pennsylvania and Maryland to correct, ascertain, and make a more skilled and exact survey. They arrived from England at Philadelphia November 13, 1763, and at once went to work under the escort of Indians from the Six Nations. Completing their field work December, 1767, they verified the work of the surveyors of 1760, and ran the western line fixed at 39 degrees 43 minutes 26.3 seconds north, since called "Mason and Dixon's Line." They did not complete the survey of the whole line, because of Indian troubles, but quit at a

point about thirty-six miles east of the western point at which they were to finish, about 244 miles from the Delaware. It was afterward completed, in November, 1782, by Alexander McLean, of Pennsylvania, and Joseph Neville, of Virginia. It was proved and made permanent in 1789.

Mason and Dixon placed stones at every mile and the coat of arms of the proprietaries respectively on opposite sides of each fifth mile-stone or station. "Mason and Dixon's Line" is, therefore, the line east and west (at latitude 39 degrees 43 minutes 26.3 seconds north), being the southern boundary of Pennsylvania and the line between that State and Maryland, and the northern boundary of Maryland. Continuing westward, it is the line between West Virginia (then Virginia) and Pennsylvania.

The settlement of the boundary between Pennsylvania and New York is discussed in a previous chapter of this work, on page 304, in the early history of New York, and need not be repeated here.

THE SEPARATION OF DELAWARE

Delaware, then known as the "territories," or "lower counties," did not remain, even during the lifetime of the good Quaker, Penn, as loyal to him as they were the day when he arrived on the *Welcome* and when they besought him to rule over them. A short time after Penn's arrival in Pennsylvania the first General Assembly, elected by universal suffrage, met. The settlers along the Delaware sent representatives and they declared the two provinces united. Only nine years later, on April 1, 1691, these same "territories" became a government by themselves, with the reluctant consent of Penn. Shortly afterward, George Keith, a Scotch Quaker, raised much opposition to Penn and his administration of affairs and carried his complaint to England, there representing that the Quaker magistrates were hostile to the Church of England. The result was that Penn was deprived of his power temporarily, and Benjamin Fletcher, Governor of New York, administered the government in Pennsylvania, and, in 1693, again united Delaware to that province. Penn was restored to his power in 1694. Delaware continued to resist consolidation with Pennsylvania, and in 1701 Penn[4] gave the charter for the Province of Delaware, which charter granted Delaware an assembly. This separate assembly was established in 1703, but until the Revolution Delaware had the same government as Pennsylvania, though, as the executive power of the latter was too feeble to restrain the power of the "lower counties," they became almost an independent republic.

THE CLAIMS OF CONNECTICUT.

The Royal charter of 1662 to Connecticut gave that colony all New England south of the Massachusetts line and west of the "Narroganatt River commonly called Narroganatt Bay" to the South Sea, with the

[4]In this same year Penn gave his subjects the "Charter of Privileges," and the government of Pennsylvania was organized upon an entirely new footing. Numerous internal differences and disturbances produced financial distress for Penn, and, eventually, he was persuaded by a friend to consider selling his province to the Crown for £12,000; but an attack of apoplexy in 1712 prevented the sale, and in 1718 the great founder of Pennsylvania died.

"Islands thereunto adioyneinge." This meant that Connecticut's territory extended west to the Pacific Ocean, and it included a strip comprising the northern two-fifths of the present State of Pennsylvania. Immediately after this a break occurred in Connecticut's claims by the granting of New Netherland to James, Duke of York. Connecticut accepted this condition, however, but when the grant to Penn took away another strip, she refused to acquiesce so readily. "The territory taken from Connecticut by the Penn grant would be bounded southerly on the present map by a straight line entering Pennsylvania about Stroudsburg, just north of the Delaware Water Gap, and running west through Hazelton, Catawissa, Clearfield and New Castle, taking in all the northern coal, iron and oil fields. It was a royal heritage."[5]

In 1753 a movement was started by Connecticut settlers to colonize the Wyoming country of Pennsylvania. The following year the Susquehanna Company was formed, with nearly 700 members, most of whom were from Connecticut. Agents of this company made a treaty with the Indians, bought a tract of land beginning with the forty-first parallel, the southern boundary of Connecticut; then running north following the direction of the Susquehanna and distant from it about ten miles, to the present northern boundary of Pennsylvania; from there, 120 miles to the west; then south to the forty-first parallel, and back to the starting point. Pennsylvania objected, but the company sent out surveyors and plotted the tract. In 1757 settlements were made on the Delaware, and in 1762 in the Susquehanna purchase. Townships were surveyed and cabins and mills erected. In 1768 "Forty Fort" was built. The proprietors of Pennsylvania leased lands to settlers if they would defend them from the Connecticut claimants. Thus started what is called the "Pennamite and Yankee War," which was waged with vigor on both sides for several years until the Continental Congress had to interfere. One of the provisions of the Articles of Confederation, which went into effect in 1781, was that Congress had power to appoint courts to settle boundary disputes between states. Pennsylvania applied for a court to decide the Wyoming controversy. The court met at Trenton in November, 1782, and, after an argument of forty-one days, decided that Wyoming, or the Susquehanna district, belonged to Pennsylvania and not to Connecticut. However, the controversy did not end until 1799, when an act was passed confirming the title to the actual settlers, and Connecticut finally gave up the struggle.

PHILADELPHIA'S RISE AND GROWTH.

Philadelphia, the City of Brotherly Love, Penn's capital, was founded in 1682, the year of Penn's arrival. The land lying at the junction of the Delaware and Schuylkill rivers was agreed upon by Penn and his surveyor,

[5]From "Connecticut," Chapter 15, by A. Johnston.

Holme, as the best location for the capital of the Province. This place was known as Wicocoa. Penn planned the entire scheme of the city complete before a stone was laid. According to his design Philadelphia was to occupy a space of twelve square miles. Today the city embraces 130 square miles. A year after Penn's arrival Philadelphia contained 100 houses; two years after, it contained 600. In 1683 a school was opened, and in 1689 was established the first public institution of learning, which for over fifty years was the only one of the kind in Pennsylvania. In 1685 the first printing press in the middle colonies began work. Andrew Bradford, son of Philadelphia's pioneer printer, started the first newspaper in 1719—the third in the colonies. Benjamin Franklin, going to Philadelphia in 1723, founded the first library and first philosophical society, and was the founder of the University of Pennsylvania and of the Pennsylvania Hospital.

THE ERIE SHORE LINE.

Pennsylvania has a shore line on Lake Erie of forty-five miles. This section of the State, the "Erie Triangle," formed part of the claims of both Massachusetts and New York in the Northwest Territory, which was ceded to the United States by them in 1781 and 1785, respectively. Pennsylvania then purchased the triangle from Congress, and the deed was signed by President Washington in 1792.

SETTLEMENT OF WESTERN PENNSYLVANIA.

Western Pennsylvania was untrodden by the foot of the white man before the year 1700. As early as 1715 and 1720 occasionally a trader would venture west of the Allegheny Mountains, but no attempt had been made by the whites at settlements in this part of the State until 1748, in which year the Ohio Company was formed. This company sent out Christopher Gist to explore the country and report. He explored "from the South Branch of the Potomac, northward to the heads of Juniata River, crossed the mountains and reached the Allegheny by the valley of Kiskiminitas." The first actual settlement was made within what is now Fayette County, in 1752, by Gist himself, on a tract of land now known as Mount Braddock, west of the Youghiogheny River. Gist induced eleven families to settle near him.

The more southern part of western Pennsylvania was visited by adventurers from Maryland previous to 1754. Two settlements were made in this section, one of them being four miles from the present city of Uniontown, before Braddock's defeat, but were repeatedly molested, together with other settlements made prior to 1760, by the Indians, and alternately abandoned and occupied. But after the Indians were subdued, in 1764, the refugee settlers returned to their cabins and clearings, and extended their improvements. From this time on the prosperity of Pennsylvania

increased rapidly, and the tide of immigration, with consequent settlements, rolled westward, though the pioneer settlers were afterwards greatly exposed.

Pittsburg, the metropolis of western Pennsylvania, was established as a military post, in 1754, by the French. Here, where the Allegheny and Monongahela rivers join to form the Ohio, they erected a fort which they named Fort Du Quesne. When the British captured the fort in 1758 they rebuilt it and named it Pittsburg, in honor of William Pitt. In this connection, Bancroft says: "It is the most enduring monument to William Pitt. America raised to his name statues that have been wrongfully broken, and granite piles, of which not one stone remains upon another; but long as the Monongahela and the Allegheny shall flow to form the Ohio, long as the English tongue shall be the language of freedom in the boundless valley which their waters traverse, his name shall stand inscribed upon the gateway of the West." In 1764 the first streets of Pittsburg were laid out.

EXTINGUISHMENT OF INDIAN CLAIMS.

This chapter should not be concluded without reference to the acquirement of titles from the Indians. The history of European settlement of North America abounds with Indian treaties, but most of them were of little worth and not at all regarded when they came in contact with the growing ambition of the whites and the extension of their settlements. The white man invades his savage brother's territory and takes possession as of divine right. The right of highest utility certainly is his, but that title which recognizes, so far as practicable, the rights of all, even though they be vague and commercially unimportant, is most to be prized.

The policy of William Penn toward the Indians was one of conciliation and of fair treatment of the primitive occupants of his territory, and so long as he lived and his ideas prevailed there was no trouble between the settlers of Pennsylvania and the Indians. Even after his spirit had ceased to control these negotiations the letter of his policy was adhered to, so that it is a somewhat remarkable fact that the entire area of Pennsylvania was, by thirty-three treaties and purchases, formally transferred by the Indians to the proprietors of Pennsylvania within the colonial period or to the State soon after the Revolution. These negotiations covered a period of 110 years. They are not free from trickery and over-reaching, but in every case the prior right of the Indians was recognized, so that the title vested in the Commonwealth or the State was technically perfect.

So careful were the Pennsylvania authorities in this respect that frequently, after the recognized aboriginal owners of the soil had surrendered definite tracts for a consideration, mere hunting rights and other shadowy claims of other Indians were likewise extinguished.

The first of this series of events was a deed of lands between the falls of the Delaware and Neshaming Creek which was negotiated by William Markham, deputy of William Penn, July 15, 1682, and confirmed by William Penn himself on October 24, of the same year. During the next three years many treaties or purchases were negotiated, so that within that time southeastern Pennsylvania and Delaware were peaceably in possession of the whites.

Some of the land descriptions of that time in connection with these purchases are very curious. For example: July 30, 1685, the Indians deeded lands described as being "between Pennepack and Chester Creek, and back as far as a man can go in two days from a point on Conshohocken Hill." The same year another deed was secured for lands backward from the Delaware "as far as a man can ride in two days with a horse." Twelve years later Taming's deed relinquished the land "between Pennepack and Neshaming and as far back as a horse can travel in two summer days." One of the largest of the early transfers was in 1718, made by the Delaware Indians, covering the lands "between the Delaware and the Susquehanna from Duck Creek to the Lehigh Hills." Another purchase involving a large but indefinite area was made in 1736. It was a deed "for the river Susquehanna and the lands on both sides thereof eastward to the head of the branches or springs running into the Susquehanna, and westward to the setting of the sun, and from its mouth to the Kittatinny Hills." Some of these purchases, the boundaries of which were more or less loosely defined, were embodied in a number of treaties or deeds. At Albany, on July 6, 1754, a treaty was arranged for the lands on the west side of the Susquehanna "from Kittatinny Mountain to a mile above the mouth of Penn's Creek, thence northwest and by west as far as the Province extends to its western boundary." This description was modified in 1758 by negotiations which set the western boundary of the ceded lands along the east side of the Allegheny Mountains.

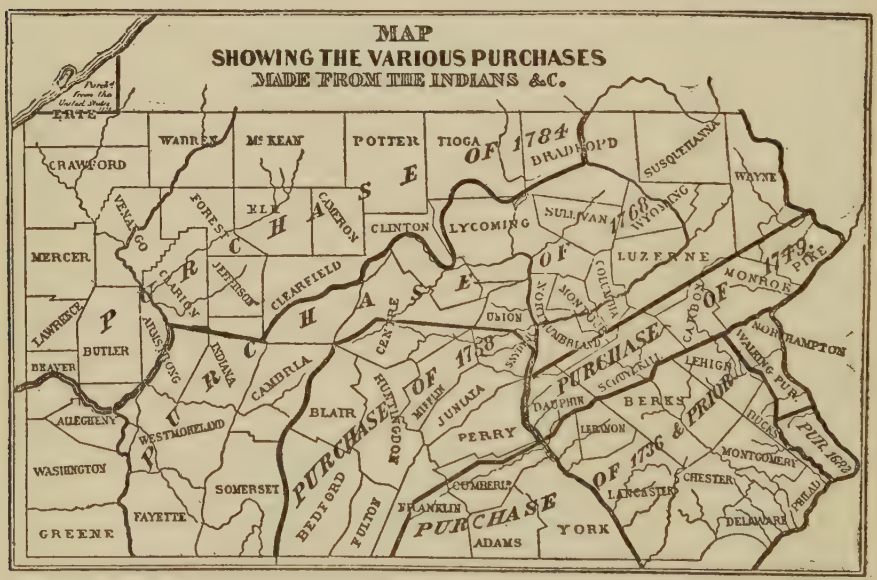
The first real extension of the Pennsylvania titles secured from the Indians into the territory west of the Alleghenies was by the famous treaty effected at Fort Stanwix (now Rome), New York, with the Six Nations, in 1768, which covered all the lands between the recognized western limit and a line described as follows: "Beginning at Owegy, on the east branch of the Susquehanna; thence to the mouth of Towanda Creek, thence up said creek to Burnett's hills, thence to the head of Pine Creek in Lycoming County, thence down said creek to the West Branch of the Susquehanna, thence up said river to the northwest corner of Cambria County, thence to Kittanning on the Allegheny, thence down said river 'to where the western bounds of said Province of Pennsylvania cross the same river, and thence, with the said western bounds, to the

south boundary thereof, and with the south boundary to the east side of the Allegheny hills, and with the said hills,' etc., to the place of beginning."

This was called the "New Purchase," and the subscribing tribes, through their representatives, were the Mohawks, Oneidas, Onondagas, Senecas, Tuscaroras and Iroquois. The consideration was $10,000. Negotiations were begun October 24, and the deed was perfected November 5, 1768.

On October 23, 1784, was negotiated, by a treaty and deed made with the Six Nations at Fort Stanwix, the purchase of the remainder of the Indian lands within the Commonwealth. The southeastern boundary of this final purchase was the line given above. The Delaware and Wyandot Indians confirmed this purchase by a deed executed by them at Fort McIntosh, on the Ohio River, where the town of Beaver now is, on January 21, 1785. The whole transaction is sometimes given as of the latter date.

After the Revolution, what is known as the Erie Triangle, which gave to Pennsylvania a harbor on Lake Erie, was purchased from the United States and a separate treaty was made with the Indians for their title to these lands. The final act of all of this long series was on March 3, 1792. The accompanying map, reproduced from Egle's "History of Pennsylvania," shows the most important purchases from the Indians.



We have referred to the dispute of Connecticut, but there was also a long conflict of authority with Virginia which laid claim, under its somewhat vague charter, to southwestern Pennsylvaina and for a long time

actually exercised jurisdiction over the territory between the Monongahela and the Ohio rivers, pending the settlement of the actual outlining of the boundaries provided for in Penn's charter. As stated before, the Mason and Dixon line was finally completed in 1782, and was proved and made permanent in 1789. During the years 1785 and 1786 the western boundary was surveyed by commissioners appointed by Pennsylvania and Virginia.

CHAPTER XXXI.

PENNSYLVANIA—FOREST CONDITIONS.

Pennsylvania, as the name itself indicates, was originally a forest. Nor was it a forest, merely, of only a few kinds of trees; it possessed a wealth of different species, many of them prominent in large areas of the State. The rocky slopes of the mountains, with which this region abounds, furnished conditions natural to the growth of trees adapted to cool, shady locations, or rocky soil; the numerous streams afforded favorable habitat for those species requiring moisture, and the fertile valleys, especially those of the western part of the State, produced trees that grow only in rich soil. Its variations of altitude brought closely together the species of various climes.

Pennsylvania abounded with white pine and other conifers, as well as different hardwood species. In 1904, according to the census of manufactures published in 1905, the chief varieties of lumber sawed in the State, in the order of their magnitude, were hemlock, oak, white pine, chestnut, maple and birch. In 1906 the order was: Hemlock, oak, white pine, maple, chestnut, beech.

NATIVE TREE SPECIES.

The great French botanist Michaux, who traveled extensively in the United States in the latter part of the Eighteenth and early part of the Nineteenth centuries, in his "North American Sylva" has much to say regarding the tree species of Pennsylvania as he found them at that time, over 100 years ago. From that work the author has drawn the following descriptions of tree species of commercial importance. Some are direct quotations, but others are condensed or paraphrased. Where two or more botanical names or common names are given, the first of each class is Michaux's; the others, names now preferred by common consent of botanists. Scattered through these quotations are many statements regarding the uses of the woods, markets and prices.

The white oak (*Quercus alba*) abounded chiefly in the middle states and in what is now West Virginia (then Virginia), particularly in that part of Pennsylvania and West Virginia lying between the Alleghenies and the Ohio, a distance of about one hundred and fifty miles, beginning at Brownsville on the Monongahela. In the vicinity of Greensburg there were large forests nine-tenths of which consisted of white oaks, though in general they were not more than fifteen inches in diameter. At Philadelphia and in the smaller towns of the middle states the frame of any well-built house, whether of brick or wood, was of white oak. West of the Alleghenies, where pine boards were

not easily procured, white oak was substituted for the floors and for the exterior covering of the frame. It was much used in the construction of mills and dams. The excellent properties of this wood caused it to be preferred for a great variety of uses, among which were many articles manufactured by the wheelwright. This trade was carried to the greatest perfection at Philadelphia, and its wares were highly esteemed for solidity both at home and abroad.

Post oak (*Quercus obtusiloba*, now known as *Q. minor*) in the vicinity of Philadelphia was considered a variety of the white oak. It was preferred for posts and was used by wheelwrights and coopers. In shipbuilding it was used for the knees and the lower part of the frame.

Chestnut white oak (*Quercus prinus palustris*), now known as cow oak (*Q. michauxii* Nuttall), in Pennsylvania was confounded with the rock chestnut oak, which it resembles. The wood was employed for wheelwrights' work and other objects requiring strength and durability. "As rails, it lasts twelve and fifteen years or a third longer than willow oak."

Rock chestnut oak (*Quercus prinus monticola*, now considered a distinct species, *Q. prinus*) on some parts of the Alleghenies formed nine-tenths of the growth, but did not exceed twenty or twenty-five feet in height and eight or ten inches in diameter. Near the Alleghenies in Pennsylvania the bark of this species was esteemed the best for tanning. It sold at New York for $10 or $12 a cord. For shipbuilding purposes it was held to be superior to every other species of its genus, except live oak.

Black oak (*Quercus tinctoria*), now yellow oak (*Q. velutina*), was found on both sides of the Alleghenies. As it was abundant in the northern and middle states, it furnished a large proportion of the red oak staves exported, or employed at home. At Philadelphia, for want of white oak, it was employed in building. From the cellular tissue of black oak was obtained quercitron, greatly used in dyeing wool, silk and paper hangings. In 1808 this substance was rated at $40 a ton at Philadelphia, from which city it was exported to France.

Scarlet oak (*Quercus coccinea*) formed a part of the forests of Pennsylvania.

Pin oak (*Quercus palustris*) was abundant beyond the mountains near Pittsburg, and was called swamp Spanish oak in Pennsylvania.

Red oak (*Quercus rubra*) in the upper districts of Pennsylvania and along the whole range of the Alleghenies was nearly as abundant as the scarlet and the black oaks.

Black walnut (*Juglans nigra*) was multiplied in the forests about Philadelphia. In the marine lumber yards of that city black walnut timber was used for knees and flooring timber. At the same city coffins were frequently made of it. Black walnut was exported in small quantities to England in planks of two inches in thickness, which were sold at Philadelphia at four cents a foot.

Bitternut hickory (*Juglans amara*, now known as *Hicoria minima*), in Pennsylvania, and particularly in the county of Lancaster, was called white hickory and sometimes swamp hickory. At Lancaster the wood was used for fuel, but was not considered superior to white oak nor sold at a higher price.

Mockernut hickory (*Juglans tomentosa*, now *Hicoria alba*) was called simply hickory at Philadelphia, but was not more multiplied in Pennsylvania than the other hickories.

Shellbark hickory (*Juglans squamosa*), (*Hicoria ovata*) abounded on the banks of the Susquehanna and Schuylkill. It was formerly employed at Philadelphia for the keels of vessels, but was seldom used for that purpose even at the time when Michaux wrote, as most of the large trees near the seaports had already been exhausted.

Pignut hickory (*Juglans porcina*), (*Hicoria glabra*) was generally known by the name of pignut and hognut hickory, sometimes also by that of broom hickory. The

first name was the most common one; the others were known only in some districts of Pennsylvania, particularly in Lancaster County.

Locust (*Robinia pseudo-acacia*) began to grow naturally in Pennsylvania between Lancaster and Harrisburg in the latitude of 40 degrees 20 minutes. West of the mountains it was found two or three degrees farther north. But the locust was most multiplied in the southwest and abounded in all the valleys between the chains in the Allegheny Mountains and particularly in Limestone Valley. Great quantities of locust posts were sold at Harrisburg; they were seven or eight feet long and the price was eighteen cents each in the rough state, or twenty-five cents when hewn and mortised. In naval architecture shipwrights used as much locust as they could procure. Nine-tenths of the locusts did not exceed a foot in diameter nor over thirty-six or forty feet in height. An important use of locust in shipbuilding was for tree-nails, or the pins attaching the side planks to the frame. Instead of decaying, they acquired extreme hardness with time, and were used to the exclusion of all others in the ports of the middle states. The mean price at Philadelphia, whither they were brought from the Susquehanna River, was $10 a thousand. From 50,000 to 100,000 of these pins were annually exported to England. The greatest consumption of locust was for posts, which were preferred for enclosing yards and gardens in the districts where the tree abounded. They were transported for the same use to Lancaster, Baltimore, Washington and Alexandria.

Sweet locust (*Gleditschia triacanthos*) "belongs peculiarly to the country west of the Allegheny Mountains and it is scarcely found in any part of the Atlantic states except in Limestone Valley and its branches, which lie between the first and second ranges of the Alleghenies, beginning near Harrisburg, in Pennsylvania, in the latitude of 40 degrees 42 minutes, and extending from northeast to southwest into the State of Virginia [now West Virginia]."

Wild cherry tree (*Cerasus virginiana*), (*Prunus serotina*). Michaux has the following to say of this species: "The wild cherry tree is one of the largest productions of the American forests. Its wood is of an excellent quality and elegant appearance and is usefully employed in the arts. . . . It is extensively employed in the small towns of the middle and western states for every species of furniture. . . . In the lumber yards of New York and Philadelphia wild cherry wood is sold in planks of definite thicknesses, which are employed for bedsteads and other articles of furniture."

Persimmon (*Diospyros virginiana*) was common in Pennsylvania. At Philadelphia shoe lasts were made of it equal to those of beech, which was usually preferred.

American chestnut (*Castanea vesca*), (*C. dentata*). In Pennsylvania it was preferred for rails and was said to last more than fifty years. For shingles it was considered superior to any species of oak.

Iron wood (*Carpinus ostrya*), hornbeam (*Ostrya virginiana*). Pennsylvania was one of the states in which this species was most abundant.

Black gum (*Nyssa sylvatica*). The Schuylkill River in the vicinity of Philadelphia was its northern boundary, though it was common in the woods on the road from that city to Baltimore. At Philadelphia it was preferred for hatters' blocks.

Tupelo (*Nyssa aquatica*). Southern Pennsylvania was one of the sections in which this species was most abundant. It was called indiscriminately tupelo, gum tree, sour gum and pepperidge. "Particularly in Philadelphia it is exclusively employed for the naves of wheels destined for heavy burdens. . . . In . . . Pennsylvania many farmers prefer the tupelo for the side boards and bottoms of carts as experience has evinced its durability. Wooden bowls are made of it, which are heavier than those of poplar but less liable to split."

White ash (*Fraxinus americana*) was always selected by coach-makers for shafts, for the fellies of wheels and at Philadelphia for the frame of carriage bodies; by wheelwrights it was used for sledges and for the handles of wheelbarrows. It was esteemed superior to any other wood for oars and second only to hickory for handspikes.

Red ash (*Fraxinus tomentosa*), (*F. pennsylvanica*) was the most multiplied of all of this species in Pennsylvania.

White elm (*Ulmus americana*) appeared to be most multiplied and of the loftiest height between the forty-second and the forty-sixth degrees of latitude. In the middle states it stretched to a great height, but did not approach the magnificence it displayed farther north.

American lime or basswood (*Tilia americana*) was found in Pennsylvania. Among the lime trees of North America, east of the Mississippi, this species was the most multiplied.

White lime tree (*Tilia alba*), white basswood (*T. heterophylla*), was abundant in Pennsylvania. It was rarely seen except on the banks of rivers. Michaux particularly observed it on the Susquehanna, the Ohio and the streams which empty into them.

Red or norway pine (*Pinus rubra*), (*P. resinosa*) was not seen south of Wilkesbarre, in Pennsylvania.

Yellow pine (*Pinus mitis*), shortleaf pine (*P. echinata*), was widely diffused in North America and was known in different places by different names. In the middle states, where it was abundant and in common use, it was called yellow pine. Immense quantities of it were used in the dock yards of Philadelphia for the docks, yards, masts, beams and cabins of vessels, and it was considered next to the longleaved pine in durability. In the northern and middle states, to a distance of 150 miles from the sea, nine-tenths of the houses were built entirely of wood, and the floors, casings of the doors and windows, the sashes of the windows, etc., were made of this species, as more solid and lasting than any other indigenous wood.

Pitch pine (*Pinus rigida*). In Pennsylvania the ridges of the Alleghenies were sometimes covered with it, particularly the ridge called Saddle Hill, thirty miles from Bedford. In the lower part of Pennsylvania it was frequently seen in large swamps filled with the red cedar. In such situations it was seventy or eighty feet high and from twenty to twenty-eight inches in diameter, and it exceeded the surrounding trees both in bulk and in elevation. On some parts of the Alleghenies, where this tree abounded, houses were built of it. It served well for ship pumps. Bakers and brickmakers of Philadelphia consumed it in enormous quantities.

White pine (*Pinus strobus*) was found in the valleys and on the declivities of the Alleghenies to their termination. The upper part of Pennsylvania, near the source of the Delaware and the Susquehanna, possessed large forests of this pine, and in the spring the timber floated down these streams for the internal consumption of the State. It was used in the construction of houses, both country and town, and was sawed into planks for exportation from Philadelphia to the West Indies. The masts of vessels built at Philadelphia were obtained from the Delaware. Beyond the mountains, near the springs of the Allegheny River, from 150 to 180 miles from its junction with the Ohio, was cut all the white pine destined for the market of New Orleans, 2,900 miles distant. In the spring immense quantities descended the river for the consumption of the country. Three-quarters of the houses at Pittsburg, Wheeling and Marietta, and at Washington, Kentucky, were built of white pine boards.

Hemlock spruce (*Abies canadensis*), hemlock (*Tsuga canadensis*), was natural to the coldest regions of the New World. In the middle and southern states it was seen only on the Alleghenies.

White cedar (*Cupressus thyoides*), (*Chamæcyparis thyoides*). The superior fitness of this wood for household utensils gave rise, in Philadelphia, to a distinct class of mechanics called cedar-coopers, and a great number of workmen were employed for the domestic and foreign market. They made principally pails, wash tubs and churns.

Red flowering maple (*Acer rubrum*). Michaux says of this species: "I have nowhere observed it of as ample dimensions as in Pennsylvania and New Jersey; in these states exist extensive marshes called maple swamps, exclusively covered with it, where it is found seventy feet high and three or four feet in diameter. . . . The wood . . . is easily wrought into lath. . . . For manufacturing purposes it is preferred by workmen to other kinds of wood. At Philadelphia it is exclusively employed for saddle trees and in the country it is preferred for yokes and also for shovels and wooden dishes."

Sugar maple (*Acer saccharinum*, now known as *A. saccharum*) was common in the upper parts of Pennsylvania. Michaux states further: "It is estimated by Doctor Rush that in the northern parts of these two states [Pennsylvania and New York] there are ten millions of acres which produce these trees in the proportion of thirty to the acre. . . . Maple sugar is made in the greatest quantities in . . . the counties of Pennsylvania which lie on the eastern and western branches of the Susquehanna; west of the mountains in the country bordering on the rivers Allegheny and Monongahela and Ohio. . . . In less, perhaps, than half a century . . . the wood will probably produce a greater and more ready profit than the sugar. The sugar maple covers a greater extent of the American soil than any other species of this genus."

Black sugar tree (*Acer nigrum*) was known as sugar tree and frequently as black sugar tree in the western states and in the parts of Pennsylvania and what is now West Virginia which lie between the mountains and the Ohio River. It covered the immense valleys through which flow the great rivers of the eastern Mississippi Valley.

Dogwood (*Cornus florida*) is the only one of the eight species of dogwood observed in North America which is entitled by its size to be classed with the forest trees. It abounded in Pennsylvania.

Cucumber tree[1] (*Magnolia acuminata*) abounded along the whole mountainous tract of the Alleghenies to their termination in Georgia.

Poplar or tulip tree (*Liriodendron tulipifera*) surpasses most other trees of North America in height and in the beauty of its foliage and flowers. Michaux says of it: "It is only beyond [west of] the Hudson, . . . and below 43 degrees of latitude, that it is frequently met with and fully developed. . . . It is multiplied in the middle states. . . . The nature of the soil has so striking an influence upon the color and upon the quality of the poplar wood that the mechanics who employ it have made the remark and have distinguished it by the names of white poplar and yellow poplar. . . . Yellow poplar possesses every quality requisite to fit it for so great a variety of uses that I shall content myself with mentioning the most common. At New York and Philadelphia, and in the adjacent country, the poplar is often employed, in the construction of houses, for rafters and for the joists of the upper stories, and for which purposes it is esteemed on account of its lightness and strength. . . . It is very cheap, being sold at half the price of black walnut, wild cherry and scarlet maple. . . . In all the country watered by the Monongahela River, between 30 and 40 degrees of latitude, the tulip tree is so abundant that large rafts, composed wholly of these logs, are made to float down its stream. At Brownsville [Fayette County] they are sawn into boards, which are used in the environs, and even at Pittsburg, in the construction of houses, which are sold at $10 per one thousand feet."

[1]According to Meehan, the great American scientist who died in 1901, this tree has attained a height of eighty feet in Pennsylvania, and seven to eight feet in circumference.

Buttonwood or sycamore (*Platanus occidentalis*) was in no part of North America more abundant and more vigorous than along the great rivers of Pennsylvania and West Virginia, being especially luxuriant on the banks of the Ohio and its tributaries.

White birch (*Betula populifolia*) was found in the lower part of Pennsylvania.

Red birch (*Betula rubra*), river birch (*B. nigra*), was more abundant in the middle and southern states than in the eastern states. Michaux states that on the Delaware, thirty miles from Philadelphia, he saw several red birches that were seventy feet in height and two or three feet in diameter. In Philadelphia its twigs were exclusively chosen for the brooms with which the streets and courtyards were swept.

Black birch (*Betula lenta*). Pennsylvania was one of the states in which this species particularly abounded. The wood is superior to the other species of American birch.

Sweet gum (*Liquidambar styraciflua*) in the middle states was numbered among the most common trees. Though inferior in strength to the oak, it sufficed for many purposes requiring strength and solidity. At Philadelphia it was used in the interior of houses, especially for the joists of the upper stories. It furnished boards of two or three feet in width, and was sometimes sawed very thin and employed by cabinet-makers to line the inside of articles of mahogany furniture. At Philadelphia it served also, though less frequently than wild cherry and curled maple, for bedsteads and for the balusters of staircases.

White beech (*Fagus sylvestris*), beech (*F. atropunicea* Sudworth), was most multiplied in the middle and western states. It was common in Pennsylvania.

TIMBER RESOURCES OF THE STATE.

Considerable has been written during the last two centuries regarding Pennsylvania's wonderful forest growth, and excerpts from some of these writings are inserted here to give an idea of the tree growth and conditions of this state at different periods and according to different observers. The following is taken from "Gottlieb Mittelberger's Journey to Pennsylvania in the Year 1750," translated from the German by Carl Theodore Eben, and published in Philadelphia in 1898:

Sassafras trees, which are not to be found in Europe, are plentiful here. . . . There are many sugar trees here which are as thick and high as an oak tree. . . . The beautiful tulip trees grow frequently there. In the month of May, when they are in blossoms, they are full of tulips; these look yellow and tabbie red, and are as natural as those that grow out of the ground. The trees are as thick and high as the tallest cherry trees. . . .

The wood in the above named new country [Pennsylvania] grows fast and is much taller, but less durable than with us. It is quite surprising how dense the forests are, and what beautiful, smooth, thick and tall trees they contain. There are many kinds of trees, mostly oaks, but they are not so fruitful as those in Germany. After this there are also beech-trees, but not many. Birch trees are rarely found, but I saw some that were very tall and as thick as a thick oak tree. I have already spoken of the poplars; they have soft wood which looks snow-white inside; there are many of them. Walnut-trees are exceedingly plentiful; this beautiful coffee-brown and hard wood is precious and useful, because all sorts of fine and elegant household furniture are made of it. When cut, a great deal of it is shipped to Holland, England, Ireland and other countries where it brings a high price. . . . Of chestnut trees there is a multitude; no less so of Hecker [hickory] nuts, which are larger than hazel nuts, but are held in little

esteem. Indian or wild cherry trees are not seen very frequently. . . . The greatest ornament of the forests are the beautiful and excellent cedar-trees; they grow mostly in the high mountains. This wood has a very strong odor, is as light as foam, and especially precious for organ pipes; for the pipes made of said cedar-wood have a much finer and purer tone than those of tin, of which I have seen sufficient proofs. All houses in Philadelphia are roofed with shingles of cedar-wood When a heavy rain pours down upon it, this wood sounds like a roof of copper or brass.

George Washington, in 1770, was sent on a tour down the Ohio River for the purpose of viewing lands to be apportioned among the officers and old soldiers who had served in the French war. From the day on which he started, October 5, 1770, until December 1 he kept a journal of his travels, from which the following is quoted, under date of October 15:

Went to view some land which Captain Crawford had taken up for me near the Youghiogheny, distant about twelve miles. This tract, which contains about one thousand six hundred acres,[2] includes some as fine land as ever I saw, and a great deal of rich meadow; it is well watered, and has a valuable mill-seat, except that the stream is rather too slight, and, it is said, not constant more than seven or eight months in the year; but on account of the fall and other conveniences, no place can exceed it. . . . The lands which I passed over today were generally hilly, and the growth chiefly white oak, but very good notwithstanding; and what is extraordinary and contrary to the property of all other land I ever saw before, *the hills are the richest land; the soil upon the sides and summits of them being as black as coal*, and the growth walnut and cherry. The flats are not so rich, and a good deal more mixed with stone.

Under date of November 21 the journal has the following to say regarding the timber in the vicinity of Pittsburg:

Reached Fort Pitt in the afternoon; distance from our last encampment, about twenty-five miles, and as near as I can guess, thirty-five from the Mingo town. The land between the Mingo town and Pittsburgh is of different kinds. For four or five miles after leaving the first mentioned place, we passed over steep, hilly ground, covered with white oak, and a thin, shallow soil. This was succeeded by a lively white oak land, less broken; and this again by rich land, the growth of which was chiefly white and red oak, mixed; which lasted with some interval of different ridges, all the way to Pittsburgh.

One John Lincklaen traveled in Pennsylvania and New York State in 1791 and 1792, keeping a journal of his itinerary. Under date of Saturday, August 13, 1791, he says that after leaving "Thornbottom," on Tunkhannock Creek, in what is now Wyoming County, "in crossing the woods to reach the north road, we passed a tract of land extremely rich, & covered with fine Mapple trees—we measured some of which the circumference was 14 feet—which means about 4¼ feet in diameter."

A letter dated June, 1821, first published in the *Village Record*, in

[2] "Early History of Western Pennsylvania," 1846, from which these extracts from Washington's journal are taken, in another place throws the following light upon the location of this tract: "Perryopolis [in Fayette County] . . . is fourteen miles north of Uniontown, in a fertile tract of land containing 1,650 acres, called Washington Bottom, which had been taken up by Colonel, afterwards General, Washington, in 1755, when this region was supposed to belong to Virginia."

southern Pennsylvania, and written by Samuel Baldwin, of Chester County, who afterwards bought land in the section described, speaks of the timber of Susquehanna County, as it was at that date, as follows:[3]

> The timber of Susquehanna County is a suitable proportion of white pine and hemlock, for building, fencing, etc., white ash, chestnut, wild cherry and beech, some white and black oak, with a plentiful proportion of sugar maple to supply a sufficiency of sugar and molasses for the inhabitants, and some for exportation.

Dr. R. H. Rose, a prominent citizen of Susquehanna County early in the Nineteenth Century, and one who did much in exploiting the natural resources and advantages of that section of the State in order to induce others to settle there, replied to queries supposed to be from an inhabitant of Connecticut, concerning the forest trees of Susquehanna County, as follows:[3]

> Some parts offer plenty of chestnut timber for fencing; in other parts it is scarce. White ash is used for rails in some places. There is very little oak timber in the country; what there is, is of a large size. White pine in some parts is plenty, large and good; however, take the country generally, there is not more than is sufficient for its consumption. There is no walnut. Cherry is plenty and of a large size.

The date of this letter is not known, but it was doubtless written about 1820–30, as Doctor Rose owned several sawmills in Susquehanna County during the first quarter of the Nineteenth Century.

The township of Oakland, Susquehanna County, derives its name from the forests of oak that were originally to be found north of the Susquehanna. Pine was also found there; but south of the river the timber was principally hemlock, maple, beech and hickory.[3]

In the township of Harford, Susquehanna County, in 1873 the timber was principally beech and maple. In the early years of the settlement pines four feet in diameter at the ground and sixty feet high beneath the lowest limb were common. Shingles were made from them three feet long, the roofs in those days being ribbed, that is, the shingles were held on by bars fastened at the ends of the roof.[3]

Potter County, one of the great white pine counties of the State, as late as 1832 was still almost a virgin forest. At that time there was scarcely an inhabitant for each 600 acres of its area. Oak, walnut, sugar maple, beech, whitewood and pine constituted its timber, which was abundant and large.[4]

Lycoming County is said to have contained in 1843 "vast forests of pine timber;"[5] McKean County, according to the same authority, was finely timbered on the uplands with hardwoods—beech, maple and cherry, while the lower valleys of the streams were covered with a heavy growth

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[3] "History of Susquehanna County, Pennsylvania," by Emily C. Blackman, 1873.
[4] From "A Gazetteer of the State of Pennsylvania," by Thomas F. Gordon, 1832.
[5] "Historical Collections of Pennsylvania," by Sherman Day, copyrighted in 1843.

of pine and hemlock, large quantities of which, even at that date, were annually sawed and taken to the Ohio River. Potter County was then "covered with a heavy growth of beech, maple, elm, basswood, pine, oak, chestnut and hemlock; and along the streams, hickory and butternut and thorn."[6] Elk County in 1843 was, for the greater part of its area, "still covered with the primitive forest,"[6] which consisted principally of white pine.

Warren County, another of the white pine counties, is thus spoken of in a history of that section:[7]

> The land originally—except, perhaps, the crests and precipitous sides of the highest hills and the few acres of bottom land devoted to the culture of corn, etc., by the Indians —was early timbered with pine, hemlock, cherry, whitewood, oak, chestnut, hickory, maple, beech, ash, butternut and all other varieties indigenous to this portion of America. As fine forests of pine, without a doubt, as ever grew on this continent then occupied the lands along the Brokenstraw, the Conewango, the Tionesta and the Kinzua. Large bodies of the same species of timber were also to be seen in many other localities; but in the vicinity of the four streams mentioned was centered the bulk of Warren's timber of commerce. The beech woods of Farmington and the hardwood uplands of Sugar Grove [referred to below] were also noted as early landmarks.

Sugar Grove Township, Warren County, received its name from "the remarkable predominance of maple timber."[7] "The surface was originally covered with a dense growth of forests—on the ridge in the south part was chestnut, to the north were beech and maple, and in the valleys were pine, maple, cherry and black cherry."

Pine Grove Township, in the same county, received its name from the superior quality of pine that originally clothed its hills. "It was this more than anything else that invited the early settlers to make this region their home."[7] This township contained the first permanent settlement of the county, which was made in 1795, and goes to show how important a factor the timber of a section may be in determining the onward march of the white man's civilization.

The following is a good description of Clarion County, in so far as its timber is concerned, as it was in 1887:[8]

> The primeval forests of pine, hemlock (*Abies canadensis*) and oak are fast disappearing. South of the river [the Clarion], with one or two exceptions, they have entirely vanished, and a secondary or tertiary growth taken their place. The ax of the pioneer, the mills and iron furnaces have done their work well there. Still, in the southern division there is considerable woodland of a later age, with oak predominating. Chestnut is abundant in almost every township, intermixed with hickory, ash and common sugar maple. The northeastern quarter of the county contains yet some forests of pine and hemlock, but they are being rapidly depleted. In many places forest fires have assisted the ax in the work, and many a spot where once stood a majestic forest

[6] "Historical Collections of Pennsylvania," by Sherman Day, copyrighted 1843.
[7] "History of Warren County, Pennsylvania," edited by J. S. Schenck, 1887.
[8] "History of Clarion County, Pennsylvania," edited by A. J. Davis, 1887.

presents the blackened, unsightly trunks rising from a dreary, profitless waste of saplings and undergrowth.

Clarion County contains a village known as Pitch Pine, which is built on an eminence formerly covered with pitch pine trees, from which it took its name.[9]

In Franklin B. Hough's "Report upon Forestry," made in 1877 and published in the succeeding year, appears the following[10] concerning the timber resources of Pennsylvania:

Pennsylvania at an early day became prominent in the production of lumber. The pine forests of the Susquehanna region have long been drawn upon for contributions to the lumber wants of the country, the supply thence obtained being rafted down the Susquehanna River, either sawed or in logs, to eastern markets. Later, the extensive pine forests of the Allegheny Valley were invaded, and Pittsburg, by means of the rafting facilities afforded by the Allegheny River, became a great lumber market, supplying the Ohio and Mississippi valleys with best qualities of pine lumber. Other sections of the State, as well as the two prominent sections above mentioned, have also long furnished considerable supplies of hardwood lumber, such as walnut, maple, cherry, hickory and oak. Since about 1850 the manufacture of shooks, for use in the West India sugar trade, has been an extensive branch of the lumber interest of Pennsylvania, the oak timber required being principally found on the eastern and western slopes and on the summit itself of the Allegheny Mountains. Although a large part of the Allegheny Valley has been almost denuded of its pine forests, and some portions of the Susquehanna lumber region have shared a similar fate, it may be said that the State is still heavily timbered, and that many years must elapse before its forests will disappear.

RANGE OF WHITE PINE.

Mr. Hough states that the white pine of Pennsylvania was somewhat limited to certain ranges and elevations, and in the northern and central parts of the State was of great size. Potter County was particularly well timbered, and the region around the headwaters of the rivers; but the best of it, even at that time (1877), had been lumbered off, much of it going to Albany by the canals. Another tract existed in Elk County and covered the divide between Sinnamahoning Creek and the Clarion River. Sometimes this timber was of large dimensions, and sometimes it divided near the root, perhaps from some accident by reason of snows, or from loss of terminal bud from insects or other cause, so that two trunks grew from one root. One particular tree from this region was said to have made 13,100 feet of lumber.

Another range of white pine lay west of the Delaware, north of Lackawaxen (a town in Pike County, at the junction of the Lackawaxen River with the Delaware), and between the Lackawaxen and Panpack Creek, in Wayne and the northern part of Luzerne, Wyoming and Sullivan counties, along the region drained by the North Branch of the Susque-

[9] "History of Clarion County, Pennsylvania," edited by A. J. Davis, 1887.
[10] "Pennsylvania and the Centennial Exposition," 1878, Vol. I, p. 155.

hanna; but this also by 1877 had been mostly cleared off. The principal pine district then being worked was on the West Branch and its tributaries, the production from which from 1851 to 1876, inclusive, was estimated to have been about 6,000,000,000 feet. This vast amount represented an area of about 2,100 square miles.

THE DISAPPEARANCE OF THE FORESTS.

In the "Report on the Forests of North America" by Charles S. Sargent, given in the tenth United States census report, published in 1884, the statement was made that the vast forests of white pine once possessed by Pennsylvania had almost disappeared from the State, and also that the original heavy growth of hardwoods had either been replaced by a second growth or had been so generally culled of the best trees that comparatively little valuable hardwood timber then remained. Large and valuable growths of hemlock, however, were then still standing in the northwestern part of the State. "From all parts of the State," continues Mr. Sargent, "manufacturers using hardwood report great deterioration and scarcity of material, and Pennsylvania, which, during the census year [1879] was only surpassed by Michigan in the value of its forest crop, must soon lose, with its rapidly disappearing forests, its position as one of the great lumber producing states." However, that day has not yet arrived; for in the last census, that of 1900, Pennsylvania ranked fourth in value of total rough lumber product, and the cut of white pine, according to that census (as was stated in a preceding chapter of this work), amounted to over 221,000,000 feet, though in 1906 it had been reduced to about 100,000,000 feet. Nevertheless, Pennsylvania's virgin forests are fast disappearing, and its future as a lumber producing State rests in reproduction, to which, in topography and soil, it is peculiarly adapted.

LOCATION OF SPECIES.

No better description of the forests of that State in the early '80's can be given than by quoting extracts from C. G. Pringle's report upon the principal lumber producing regions of Pennsylvania, given in Sargent's report mentioned before. He says:

> Originally, the broad pine belt of northern Pennsylvania, occupying the region drained by the numerous streams constituting the headwaters of the Susquehanna, extended from Susquehanna County, in the northeastern corner of the State, westward through Bradford and Tioga counties to Potter County, although this county never had as much pine as the others, and thence southwestward over Cameron, Elk and Clearfield counties. The heaviest growth of pine in all this region was on Pine Creek, in the southwest part of Tioga County. Now there is but little pine left in Susquehanna and Bradford counties, these counties being thickly settled; and in Tioga County, from which one firm alone has cut 4,000,000,000 feet, there now remain standing but little over 1,000,000,000 feet. The greatest part of the pine now standing in the Pennsylvania forests is on the upper waters of the West Branch of the Susquehanna, in

Cameron, Elk and Clearfield counties. In some of the counties adjoining these,[11] as McKean, there was once, and still may be, a little pine timber.

. . . Lumbermen agree that there was originally far more hemlock than pine in this State, and they speak of it now as inexhaustible, which is not strictly true, for it is doubtful if it holds out to supply the increasing drain made upon it by tanneries and sawmills for more than twenty-five years to come. Large quantities of hemlock have been wasted. Much of it that grew intermingled with the pine has died after the pine has been removed, partly from exposure to fuller sunlight and summer drought, and partly to forest fires induced by and following lumber operations. . . .

Inasmuch as hemlock, besides mingling more or less with pine throughout the pine belt, seems to have formed a border entirely around the pine, the extent of the hemlock woods, as well as the quantity of hemlock timber, has always been much greater than of pine. Beginning in Wayne County, in the extreme northeastern corner of the State, the original hemlock forest extended westward through the northern tier of counties as far as Warren County, in the vicinity of Lake Erie. Thence its bounds may be traced southward through Forest, Clarion and Jefferson, and thence eastward through Clearfield, Center, Clinton, Lycoming and Sullivan counties. Now the northeastern counties are for the most part cleared, and not only have the outskirts of these woods been cut off on all sides, but their continuity has been completely broken up throughout its whole extent by countless clearings and settlements. Yet, however much the hemlock forest has suffered, it possesses today greater value than did all the pine standing in 1850. . . . Lumbermen classify hemlock into two kinds, red and white, according to the character of the wood, but the more intelligent among them attribute the difference to soil and situation. . . . The quality of the hemlock seems to deteriorate west from the center of the State. The Pine Creek hemlock is considered better than that of the Sinnamahoning, and this better than that on the Allegheny. . . .

From Lock Haven [Clinton County] to Warren, the county seat of Warren County, . . . we saw much original forest still standing and principally composed of hemlock. Some white pine appeared as scattering trees or in groves, and some hardwood. The proportion of hardwood increased as we ascended the divide between the waters of the Susquehanna and those of the Allegheny River.

On the summit of this divide the forest had a truly northern aspect, except that we missed the spruce, not seen in Pennsylvania. The dark foliage of the hemlock mingled with sugar maples, beeches and birches. For many miles above Lock Haven it was a second growth which occupied the hillsides, a thin growth of white oak, chestnut, locust, etc., which had followed the lumberman and forest fires. Considerable second-growth white pine was seen in a few places, but on this none of the present generation seem to set much value, and I have yet to meet any one in the State who gives a thought to encouraging and preserving such growth. To consume the forests as speedily as possible, satisfied with what can be realized from them in the operation, appears to be the spirit which rules this region. Alternating here and there with the original forest mentioned above were seen all along the railroad leading through this timber belt . . . tracts which have been ranged by fire. . . .

I learned that the best hemlock grows on the steep sides of the deep runs, and that upon the summits of the divides were considerable barrens, the soil of which was sometimes too poor to support any arboreal growth. Farther to the west the summits of the dividing ridges are occupied by hardwood chiefly, although hemlocks mingle with the beeches and maples.

[11]The last considerable solid tract of white pine in Pennsylvania was in Warren County and was cut in the later '90's.

Arrived at Warren, we find that we have passed through the woods and are in a long-settled and well-improved country, and, judging from the scattered patches of woodlands occupying the low hills within view, the region of hardwood forest has been reached. The coniferous forest belt only extends into the southeastern quarter of Warren County; the northern and western portions, lying beyond the Allegheny River, yield oak, chestnut, hickory, etc. Originally, there was a little pine scattered over the southeastern portion of Warren County, but this has been mostly cut, and hemlock remains, as it ever has been, the most important timber in this part of the county. In Forest County, next south of Warren, pine is local, being scattered in small quantities throughout the county. On the highlands there is much hardwood, beech, maple and whitewood existing in belts between the streams. This, however, may be called a hemlock county. In McKean County a central tableland is covered principally by a growth of maple, beech, etc. In the remaining portions of the county the timber is chiefly hemlock. The valley of the Allegheny River, in the eastern part of McKean County, is mostly cleared and improved. Elk County is one of the best counties for hemlock. Through Elk, the southwestern corner of McKean and the southeastern corner of Warren runs the Philadelphia & Erie Railroad.[12] Along the line of this road, as it passes through this portion of the timber belt, are located the largest tanneries of the United States. These are consuming the hemlock of this region at an enormous rate, and, in addition to the vast amount of bark which they consume, large quantities are shipped out of the region by railroad. The first important tanneries of Warren County were established twelve or fifteen years ago, and at the present rate of consumption the hemlock of this county can hardly hold out twenty years longer. . . .

In this region the aspen springs up on land upon which the hemlock has been destroyed, but this tree manifestly does not thrive as it does in northern woods. Yellow and black birch, bird cherry, beech, maple, white oak, chestnut, black cherry, etc., are the trees which spring up slowly among the briers, and cover burned land with a rather meager second growth. . . .

The pine now remaining in Clearfield County is mostly found in the northern and southwestern portions of the county. The eastern and southeastern portions are now principally cleared and improved, as the entire county is destined to be, the soil being . . . excellent for farming purposes. Already four-fifths of the pine timber originally standing in the county has been removed; most of the hemlock, which originally about equaled in amount the pine, remains. .. . .

With respect to the maximum yield of pine per acre, it would seem that 10,000 feet was a good yield for tracts of 400 or 500 acres in extent, although smaller tracts of fifty acres and upward will often cut 25,000 feet to the acre, and even a yield of 100,000 feet to the acre has been reported.

FORESTRY IN PENNSYLVANIA.

For a third of a century sentiment has been growing in Pennsylvania in favor of better treatment of the timber of the Commonwealth, but it is only within a few years that much has been accomplished along this line. The forest wealth of the State was of such magnitude that two centuries passed before there was a realization of the fact that this wealth was not limitless and must needs be conserved if it were to be continued. Governor Hartranft, whose term of office began in 1873, was the first

[12]Now the Pennsylvania.

PENNSYLVANIA HEMLOCK—VIEW NEAR RIDGWAY, ELK COUNTY

chief magistrate of the State to draw public notice to this matter. He briefly called attention to the future need of forestry legislation. Likewise did Governor Beaver (1887), and, besides, he had the matter discussed in the meetings of the State Board of Agriculture, and the Legislature authorized a report on the subject to be prepared by a committee, thus paving the way for legislation. But nothing came of it.

Governor Pattison's administration (1891) saw the first forest reserve bill prepared. It urged the creation of three State forestry reservations, of 40,000 acres each. The Governor was influential in casting the bill into such shape that it was later adopted by the State Forestry Association. It was called the Association bill and in the next administration it became a law, largely through the efforts of the Association members. During Governor Pattison's administration the Forestry Commission was appointed, whose duty it was to report upon the State's forest condition and point out lines suitable for legislation. During Governor Hastings' administration (1895), this commission made its report. When the new Department of Agriculture was created in 1895 forestry was taken care of and a special Division was organized for the carrying on of its work. Laws were passed providing for the acquisition by the State of lands sold for taxes and not redeemed, and fire laws were enacted.

Governor Stone (1899) promptly entered upon the task of providing forest reservations for the people of the State. The work of the Commission grew to such an extent that it was soon found necessary to place forestry by itself and give larger powers to those who were to purchase and take care of the acquired lands. Consequently, a bill was introduced creating a Department of Forestry, which bill became a law February 25, 1901. It was entitled "An Act to Establish a Department of Forestry, to provide for its proper administration, to regulate the acquisition of land for the Commonwealth, and to provide for the control, protection and maintenance of Forestry Reservations by the Department of Forestry."

Section 1 provided for the establishment of a Department of Forestry, "to consist of the Commissioner of Forestry and four other citizens of the Commonwealth, who together shall constitute the State Forestry Reservation Commission," these persons to have full authority, with the consent of the Governor, to buy any suitable lands in the State that in the judgment of the Commission should be possessed by the State for forest preservation, provided the price did not exceed $5 an acre. The Commission was given power to manage and control all these lands and also to make the rules and regulations in reference to their control and management; was empowered to sell timber on them and, with certain restrictions, to make contracts or leases for mining the minerals found thereon.

Section 2 provided penalties for kindling fires on forest reservations (except in accordance with the regulations of the Commission), for cutting, removing or damaging timber belonging to the State, and provided for the disposition of the fines so collected.

Section 3 defined the offices, duties and powers of the Commissioner of Forestry.

Section 4 provided for the salary of the Commissioner of Forestry, and for his expenses and those of the other members of the Forestry Reservation Commission incurred in the performance of their duties.

Sections 5 and 6 provided for the offices, supplies, etc., of the Commissioner of Forestry and of the Department of Forestry; for the transfer of unexpended moneys, appropriated for the former Division of Forestry, to the Department of Forestry, and for the transfer of the clerk to the Department of Forestry.

Section 7 provided for the payment of all expenses, except salaries, out of the treasury.

Section 8 provided for titles; for exemption from warrant, survey or patent, and from taxation, of all forestry reservation lands; also for the maintenance of roads in or bordering these lands and for the expenses of same.

Section 9 provided for the payment, by the Commissioner of Forestry, of all moneys received through sales of timber leases, etc., to the State Treasurer, and for the bond to be given by the Commissioner to the Commonwealth for the faithful discharge of his duties and the proper accounting for moneys.

Section 10 repealed all acts or parts of acts inconsistent with the above. The act was approved February 25, 1901, and signed by Governor William A. Stone.

The only respect in which this law has failed to accomplish all that was intended is that regarding the leases of mineral lands, which section is so hedged around with seemingly necessary safeguards as to be prohibitive. On account of this feature of the act no reservations had up to 1907 been purchased in the Ohio Valley, which lands are rich in minerals, but the Commission was in that year prepared to receive offers from that section.

AREAS OF RESERVED LANDS.

When Governor Stone was inaugurated, in 1899, the State owned less than 20,000 acres of forest reserves, and at the close of his administration in 1903 it possessed nearly a half million acres, principally secured by actual purchase. Acquirement through tax sales was comparatively small. Up to 1905 the State had purchased at tax sales under provisions of the acts of March 30, 1897, and April 28, 1899, 56,069 acres in various

counties for forestry purposes. Of this amount, after deducting the number of acres afterward redeemed by the owners within the prescribed limit of two years, there was left to the State 23,248 acres.

The following table shows the location and area of lands owned by the Commonwealth and under forestry control in 1905:

COUNTIES.	Acres.	Perches.
Adams and Franklin (South Mountain Reservation)	40,323	77
Franklin and Fulton	7,859	13.5
Juniata and Mifflin (Rothrock Reservation)	7,805	110.6
Cumberland	860	.....
Dauphin	3,353	93
Lackawanna	2,853	147
Wyoming	1,176	90
Bedford	5,686	54
Huntingdon (Trough Creek region)	6,146	155
Monroe	5,622	4
Elk	2,263	.....
Clearfield	17,546	116
Cameron	22,752	153
Centre (Nittany Mountain)	4,135	28
Centre	3,974	121
Potter	47,377	80
Pike	47,810	124
Clinton and Centre (Hopkins Reservation)	88,518	39
Clinton (McElhatton Reservation)	7,394	99
Lycoming (White Deer Creek region)	3,617	99
Lycoming (Loyalsock Creek region)	5,903	41
Lycoming and Tioga	72,272	37.7
Union, Centre, Snyder, Mifflin and Huntingdon (Central Reservation)	144,310	100.2
Total	549,565	22

Up to June, 1907, the above total had been increased, by additions to existing reserves and by the acquisition of new ones, to 735,000 acres, lying in twenty-four different counties. Most of the reserve lands lie in the central counties of the State, from north to south. This is the central mountain district, thinly inhabited and with little of its soil adapted to agriculture. There is a smaller, but important group of reserves in Monroe and Pike counties, in the extreme eastern part of the State, and some small reserves are found outside of these two groups.

Some of the larger reserves may be specially mentioned. The South Mountain Reservation is located on lands lying southwest of the Susquehanna River and on the southeasterly side of the Cumberland Valley. It consists of two divisions—the Mont Alto and Caledonia. Rothrock Reservation lies in and along the valley of Licking Creek in Mifflin and Juniata counties, and in Black Log Valley in Huntingdon County. Hopkins Reservation is located between the Susquehanna River and Beech Creek, in Clinton and Centre counties. Stone Reservation, not named in the above table, occupies lands lying generally in Tioga County, Pennypacker Reservation lies in southwestern Perry County. This is one of the latest acquired forestry tracts.

USES OF THE RESERVATIONS.

Pennsylvania's forest reserves have already, though established so recently, been devoted to a number of useful purposes. Besides serving to preserve the trees already growing upon them, they have been put to

the following uses: As forest nurseries; as sanatoriums; as hunting, fishing and camping grounds; as protecting water supplies for cities, and as the training grounds for a forestry school.

Thus far the energies of the Department of Forestry have mostly been given to the acquisition of lands, and, therefore, scientific forestry methods have been applied to a small portion only of the reservations. Improvement cuttings have been made on the Mont Alto Division of the South Mountain Reservation, and the areas thus treated are returning to the State several times their original cost. Another branch of practical forestry was begun at Mont Alto in the shape of a forest tree nursery. This was started in April, 1902, and is the State's first white pine plantation. Six pounds of white pine seeds were sown; 10,000 one-year-old white pine seedlings and, later, 5,000 two-year-old white pines were set out. The results were good and the nursery has since been improved and enlarged. These trees, when of proper age, furnish plantings for all available places on the reservation.

A sanatorium, also in Mont Alto Division of the South Mountain Reservation, among the white pines of that reservation, is maintained by the State for poor consumptives. This camp sanatorium was started in June, 1903.

Parties desiring to camp on State reserves may do so by applying to the Commissioner of Forestry, who sends a blank application containing the rules governing campers. This must be signed and returned to the Commissioner, who then issues a permit. Briefly stated, campers agree to violate no game, fish, or forest law of the State; not to destroy or interfere with birds' nests; to make all open fires only in a hole one foot deep, encircling hole with earth taken out; to see that all fires are absolutely extinguished; to throw no lighted match, cigar, etc., on the ground; to cut down or injure no living trees; not to erect a camp until a permit is received and to report to a forest officer and follow his instructions with respect to a camp site; not to be members of any camping party consisting of more than ten persons, nor to remain upon the State reservation lands longer than two weeks without special additional permission; to report all violations of the law or of the rules governing State forest reservation lands coming under their observation; to erect no permanent camp or structure upon the reservation; to construe no camping permit as conferring the privilege of preëmpting any ground as their special site to the exclusion of others desiring to camp near; neither to take any dog into camp, nor use such for hunting during the open deer season; to build no fire upon deer or other "runways"; to place no advertisement on the lands; to recognize the authority vested by law in superintendents, wardens and other reservation employees, and to aid them in performing their duties.

Persons desiring to picnic on State reservation lands, remaining for less than a day, are not required to procure a camping permit, but in all other respects are governed by these rules. Grazing of horses, sheep, etc., on reservation lands is forbidden, except under direction of the Commissioner of Forestry.

Another use of forest reserves—and one that will receive more attention in the future—is that of protecting water supplies for important towns. For example, the State owns the land from which the town of Clearfield derives much of its water. A large part of the McElhattan watershed, from which Lock Haven receives its water supply, belongs to the State. Reafforestation at the heads of streams will also be a help to navigation and water powers, making the water supply more uniform and constant, and will reduce the violence of floods, from which the inhabitants of western Pennsylvania especially suffer. The State, up to 1907, owned no reserves in that section. It might be mentioned in this connection that the great floods along the Susquehanna and its branches during the last fifty years, in which lumbermen lost most heavily, are attributed to the destruction of the forests by lumbering and by fires.

The State of Pennsylvania, in order properly to train men to care intelligently for her forest reservations, maintains a forest academy at Mont Alto, South Mountain Reservation. This school was established in accordance with the provisions of an act of Assembly approved May 13, 1903, and opened in June of the same year. The instruction is both practical and theoretical and consists of a three years' course. Much valuable work has already been done on the reservation by the pupils of this school.

FOREST LEGISLATION.

Pennsylvania, in respect to its forestry legislation, may safely be said to be well in the front rank of the states of the Union. Much has been accomplished by this Commonwealth toward the preservation and care of what remains of its once noble forests. It is, perhaps, remarkable that, with all the popular dislike that usually attaches to the creation of a new office, there was practically no real criticism of the act creating the Department of Forestry in Pennsylvania, nor was there any doubt as to the wisdom of purchasing land for State forest reservations.

It is not necessary here to review the whole of Pennsylvania's forest legislation, but some of the more important acts, relating to other matters than fire prevention and forest culture, which are treated elsewhere in this chapter, may be mentioned.

As will be seen further on, the forests were recognized in legislation before the time of William Penn; but under the proprietor laws which recognized the property value of the forests were enacted.

In 1700 an act was passed prohibiting felling, removing, etc., any tree or other landmark under penalty of not less than £10. In the same year felling trees on another's land without permission was forbidden by an act in which the superior value of black walnut was recognized. The penalty for cutting black walnut was the forfeiture of £5 for each tree to the owner. In the case of other timber the penalty was fifty shillings per tree, and for cutting firewood or "under-wood" double the value thereof.

A curious act was passed in 1782 declaring that trees growing in the streets, lanes and alleys of Philadelphia were a nuisance and ordering commissioners to remove all such trees. That act was passed in April, but in the September following it was repealed in consequence of protests which were thus referred to in the act: "Whereas, a considerable number of the inhabitants of the city of Philadelphia have, by their petition, set forth that trees planted in the streets thereof conduce much to the health of the inhabitants, and are in other respects of great public utility."

March 29, 1824, an act was passed regarding trespass which provided that "cutting or causing to be cut, timber trees, knowing the same to be growing on lands of another, without latter's consent, be declared a misdemeanor punishable by fine at the discretion of the court." It was provided further that owners might sue for damages, "the measure thereof being double the value of trees felled; and in case of conversion of the said trees, treble the value. And no prosecution to be a bar to such suit." Thus violaters of the act could be proceeded against both criminally and civilly. In 1840 the penalties of the above act were extended to persons receiving or purchasing timber which they knew to be thus illegally cut. In 1850 an act for the benefit of the mortgagees of timber property was passed.

March 31, 1860, an act was passed which contained the following provision. "Section 152. Cutting timber trees knowing the same to be growing on lands of another, without latter's consent, or knowingly purchasing or receiving such timber or any lumber made therefrom, is declared a misdemeanor punishable by fine not exceeding $1,000 or imprisonment not exceeding one year, at the discretion of the court."

In 1869 it was declared unlawful for owners of undivided interest in timber lands to cut or remove timber without consent of co-tenants.

LEGISLATION TO PROMOTE TREE PLANTING.

Apparently the first act to encourage tree planting was one dated May 2, 1879, providing for a rebate from the road tax payable by a property owner for the planting of trees along the highways and on his premises and in adjoining cultivated fields.

June 1, 1887, an act was approved providing for an annual rebate of taxes on lands planted with forest trees. In 1901 the Legislature amended

the second section of the act which originally provided that notice must be given to the county commissioners within one year after the lands had been cleared of merchantable timber, that they would be maintained in timber, to secure the rebate. As amended notice can be given at any time after the land has been cleared, but the first period of ten years shall be counted from the time the land was cleared.

The act is entitled, "An act for the encouragement of forest culture, and providing penalties for the injury and destruction of forests." Section 1 provides that the owners of land planted with forest or timber trees in number not less than 1,200 to the acre, shall, on making proof thereof, be entitled to receive annually from their county commissioners, so long as the trees are continued in sound condition, the following sums of money:

For a period of ten years after the land has been so planted a sum equal to 90 percent of the annual tax, or so much of it as shall not exceed forty-five cents an acre. For a second period of ten years, a sum equal to 80 percent of the taxes, or not to exceed forty cents an acre. For a third and final period of ten years a sum equal to 50 percent, or not to exceed twenty-five cents an acre. Provided, that owners may, after land has been planted ten years, thin out the trees to not less than 600 to the acre, so long as no portion is absolutely cleared; and provided also that the benefits of the act do not extend to nurserymen or others growing trees for sale.

Section 2, as amended March 22, 1901, provides as stated in the first paragraph above, relating to this act.

Section 3 provides a penalty not exceeding $100,[13] with costs of suit, for each offense, or, upon failure to pay penalty, imprisonment of not less than one day for each dollar of the penalty imposed, upon any person cutting, burning, or injuring any tree in the Commonwealth, without the consent of the owner, or kindling or carrying (except in closed vessel) fire of any description on timber land.

Section 4 provides for the arrest of any violator of the act upon complaint by the affidavit of one or more persons.

An act was passed on April 11, 1901, signed by Governor Stone, to correct some of the provisions of the act of May 25, 1897. It relieves the farmer and small land owners of a part of their taxes on lands that they maintain in timber.

This rebate has been applied for in a number of the counties of the State, and has been granted in some, but refused in others on the ground that the act is unconstitutional. The act is entitled, "An act to encourage the preservation of forests by providing for a rebate of certain taxes levied thereon."

[13]The original act read $50, but this was amended to $100 by act of May 14, 1891.

Section 1 provides that the owner of land having on it forest trees averaging not less than fifty trees to the acre, each tree to measure at least eight inches in diameter at six feet above the ground, with no part of the land absolutely cleared of trees, shall, upon filing with the county treasurer and tax collectors an affidavit showing the number of acres of timber land within the requirements of this act, be entitled to receive annually, during the time the trees are maintained in good condition, a rebate equal to 80 percent of all annual taxes on said land, or so much of 80 percent as shall not exceed forty-five cents an acre, the said rebate to be deducted from taxes. It is provided that no one property owner shall be entitled to receive the rebate on more than fifty acres.

Section 2 provides for the repeal of all acts or parts of acts inconsistent with this act.

An old act, of May 2, 1879, to encourage the planting of trees along the roadsides was much improved by the act of July 2, 1901, entitled, "An act to encourage the planting of trees along the roadsides of this Commonwealth, and providing a penalty for killing, removing or injuring the same; what disposition is to be made of moneys collected as penalties, and for keeping a record, by the supervisor of roads or boards of supervisors of roads, of the trees so planted and upon which a tax abatement has been granted."

On June 17, 1901, an act was approved entitled, "An act authorizing boroughs of this Commonwealth to require the planting of shade-trees along the public streets thereof, by the owners of abutting property, in certain cases."

The Pennsylvania Forestry Association, one of the oldest and probably the best organized and most efficient associations of the kind in the United States, has given much valuable assistance to the cause of forestry in the State. It originated some of the laws on the statute books, and has given cordial support to all measures promising good to the forestry cause.

FOREST FIRE LEGISLATION.

Pennsylvania, first as a province and later as a state, has been engaged for a period covering more than two and a quarter centuries in an effort to subdue that greatest of all enemies to the forests—fire. But even yet the victory is only partly won.

As early as 1676, when the Duke of York claimed the Delaware River country, the code of laws previously formulated for the government of New Netherlands was extended to the Delaware River provinces. Among these laws is probably the first forest fire law enacted for Pennsylvania; but as then enacted it was more for the protection of corn grounds and enclosures from fires started within the forest, than for the protection of the forest itself. This part of the law is as follows:

If any Person whatsoever shall kindle any fire in the woods or Grounds lying in Common, or in his own Grounds so as the same shall runne into any Corne Grounds or Enclosures of his Neighboures, he shall be Lyable to pay all Damage; of whatsoever Sort, and half so much more for a fine; or if not able to pay the Court shall Adjudge the Person guilty of Corporal punishment not exceeding tweenty Stripes, or do Service to Expiate the Crime.

After William Penn came into possession of his territory and the Duke of York had relinquished his claim to the Delaware counties, the following law relating to forest fires was promulgated at a meeting of the Provincial Assembly at Philadelphia, March 10, 1683:

Chap. XCIII. Be it, etc., That Whosoever shall presume to sett on fire, any Woods, Lands, or Marshes, in this Province or territories thereof, before the first day of the first moneth yearly; They shall yearly make good all the Damages that shall thereby happen to any of the inhabitants thereof.

Ten years later this law was abrogated by the English sovereigns William and Mary, but was reënacted the same year, 1693.

The next act regarding forest fire legislation was that passed by the Provincial Assembly November 27, 1700, and is as follows:

An act against unseasonable firing of woods.

For the prevention of dangers and damages that may ensue upon firing of woods at unseasonable times of the year:

Be it enacted by the Proprietary and Governor, by and with the advice and consent of the freemen of this Province and Territories in General Assembly met, and by the authority of the same, That whosoever shall presume to set on fire any woods, lands or marshes in this province or territories, before the first day of the First month yearly, or after the first day of the Third month, shall make good all damages that shall thereby happen to any of the inhabitants thereof.

It appears that firing the woods at seasonable times, during March and April, was considered the right thing to do, and, probably, was regarded as a necessary means toward settlement. But this practice, doubtless, caused so much damage that on March 27, 1712–13, the above act was amended as follows:

And be it further enacted, That if any person or persons do at any time hereafter set on fire any woods, lands, marshes or cripples though within the time limited by a law of this province entitled "An act against unseasonable firing of woods," within one mile of any fences or buildings, without giving notice to the possessor of such improvements at least twenty-four hours before he do so, he or they shall pay all damages that shall thereby happen to any such buildings or fences.

March 29, 1735, is the date of the next act dealing with the forest fire problem. This law shows a marked change in sentiment regarding the burning of the forests. The act was entitled, "An act to prevent the damages which may happen by firing of woods." The first paragraph contains this statement: "It hath on experience been found that the setting the woods on fire at any time hath proved rather hurtful than beneficial to this province and great losses have happened by occasion of

such fires." Then follows repeal of the act of 1700 "against unseasonable firing of woods." The remainder of the act is in part as follows:

> And be it further enacted by the authority of the aforesaid, That whosoever shall presume at any time or times hereafter to set on fire or cause to be set on fire any woods, land or marshes whatsoever within this province, so as thereby to occasion any loss, damage or injury to any other person or persons, every such person or persons so offending shall and are hereby declared liable to make satisfaction for the same in any action or actions on the case to be brought by the party or parties grieved in the court of common pleas in the county where the offense was committed. . . .
>
> Provided also, That where any offense shall be committed against the tenor of this act by any servant, negro or slave without the direction of his, her or their master or mistress respectively, and such offender be thereof duly convicted by the oath or affirmation of one credible witness before any justice of the peace of the respective counties, such offender or offenders, unless his or her master or mistress will pay the damages sustained, with costs of suit, shall be whipped with any number of stripes not exceeding twenty-one on his or her bare back at the direction of the justice before whom the party shall be convicted and further shall be committed to the workhouse of the county where the offense is committed, there to remain until the costs of prosecution shall be paid.

According to this act no "seasonable time" for firing the forests was recognized, and the law remained unchanged for sixty years—until after the American colonies had declared themselves free and independent and the National government had been organized. The evil of forest fires was growing more apparent and more burdensome, and, to further meet the demands of the question, the act of April 18, 1794, was passed. This act bore the title, "An act to prevent the damages which may happen by firing of woods."

Section 1 provided that any person who set fire to any woods, thereby causing loss or damage to another, and who was legally convicted thereof by oath of witness in the "county court of quarter sessions," should pay a fine not over $50 and not less than $20, one-half of which to go to the informer and the other half to the overseer of the poor, for the use of the poor of that township.

Section 2 provided that any such offender was liable to make satisfaction for the damage done, "in any action or actions on the case, to be brought by the party or parties grieved, in the court of common pleas of the county in which the offense was committed."

Section 3 provided for the payment of damages by the offender to the party injured, together with the costs of prosecution, provided that the offender had the right of appeal to the next court, if he deemed himself "aggrieved by the determination of any justice of the peace, in consequence of this act."

Section 4 provided for the punishment of any servant violating the act and convicted by oath of witness, by being put to hard labor in the

county "gaol" for three months, "and from thence until the cost of prosecution be paid," unless his master paid the damages, with costs of suit.

Section 5 repealed the act of March 29, 1735.

By this act the criminal aspect of setting fire to the forests was emphasized; for what was formerly considered a crime in only a servant or slave was now criminal in anyone.

The act of March 29, 1824, was designed to prevent the destruction of forests by unlawful cutting as well as by fire. The first three sections refer wholly to unlawful cutting of trees and the penalties therefor and have previously been quoted. The title of the act is, "An act to prevent the destruction of timber, and supplementary to the act entitled, 'An act to prevent the damages which may happen by firing woods,' passed eighteenth of April, seventeen hundred and ninety-four."

Section 4 provided that any person setting on fire any woods, etc., in the Commonwealth and being convicted thereof by oath of one or more witnesses, should be fined a sum not exceeding $500, one-fourth to the informer, and the residue to the overseers of the poor of the township or county, for the use of the poor, and might also be imprisoned in the county jail and put to hard labor not exceeding one year.

Section 5 repealed the first and fourth sections of the act of April 18, 1794.

In the act of March 31, 1860, commonly called the "Criminal Code," in Section 140, the penalty fixed by the act of March 29, 1824, for setting fire to woods, was reduced to $100, but the term of imprisonment was not changed.

The act of March 26, 1867, fixed penalties for setting forest fires in the counties of Clearfield, Fulton and Elk. It also extended the statute of limitations so that prosecution could be brought within six years. This was the first statute offering a reward for the apprehension and conviction of the offender. It directed the county commissioners to pay to the prosecutor in every such case the sum of $50, and to the district attorney who secured the conviction the sum of $20.

Another special act, that of April 9, 1869, related to Union County only, but was extended, by act of June 2, 1870, to Schuylkill, Lehigh, Berks, Lycoming, Centre, Snyder and Luzerne counties, Lycoming being subsequently excepted by act of May 19, 1871. The fines imposed ranged from $50 to $500 and imprisonment from one month to twelve, within the discretion of the court.

The preamble to this act is especially interesting in connection with the subject under discussion in this chapter, because it offers as a reason for the passage of the act some of the very ideas which the forestry administration of the State has been urging since the inception of its work. This preamble follows:

Whereas, There being certain mountain and other wild lands in the county of Union which are fired from year to year, thereby destroying the young timber and causing the land to be worthless for the purpose of timber: And whereas, Should such young timber not be destroyed it would add to the value of the land, in the course of twenty years, from fifty to one hundred dollars per acre, thus increasing the wealth of the county thousands of dollars, therefore, etc.

The Legislature recognized the fact that it is better to prevent fires than to extinguish them after they are started. An act was approved June 2, 1870, entitled, "An act to protect timber lands from fire," which provided for the appointment of detectives for this purpose, the expenses so incurred to be paid out of the county treasury. This act was later amended, as is given farther on in this chapter.

By the act of June 11, 1879, the penalty of $100, fixed by the act of 1860, was raised to $300, term of imprisonment as formerly, and the county commissioners were directed to pay to the prosecutor the sum of $50 as a reward.

The more comprehensive act of June 1, 1887, is fully discussed on a previous page of this chapter, and its provisions, regarding forest fires among other things, need not be repeated here.

FIRE WARDEN LAW OF 1897.

The next law, in chronological order of discussion, is that of March 30, 1897—about which there has, perhaps, been more contention than concerning any other law of Pennsylvania relating to the forests. If rigidly observed, this law would, to a degree hitherto unknown, prevent the wholesale burning and destruction of valuable forests. This act makes constables of townships ex-officio fire wardens, giving them authority to summon help for putting out fires in their townships, providing for the payment of those so engaged and dividing the cost thereof between the county and the State. It also requires constables to make to the courts quarterly returns of violations of the forest fire laws, providing penalties for failure to do so, and making it "the special duty of the judge of said court to see these returns are faithfully made." This act is "more honored in the breach than the observance." Constables refuse to extinguish fires because the commissioners refuse to pay them, and the commissioners refuse to pay them because of the alleged unconstitutionality of the act. Many of the courts have given the act no support. Its constitutionality has been under trial, and it has been both condemned and vindicated by judges.

The act of March 22, 1899, is practically a repetition of the act of March 30, 1897, so far as it relates to making the constables ex-officio fire wardens. It, however, extends to borough constables and gives them power to arrest without warrant.

April 29, 1897, an act was passed authorizing constables and other peace officers to arrest on view without warrants persons trespassing upon forest or timber lands with the appearance of having committed or to be about to commit some offence against the laws protecting such lands.

The act of July 15, 1897, amended the act of June 2, 1870, mentioned before, by fixing a penalty for the refusal by county commissioners to appoint detectives; by dividing the expense of maintaining detectives between the county and the State, and fixing a limit of $500 to the expense incurred by a county on this account during any one year.

The purposes of the act of 1870 were still further enlarged by the amending act of May 2, 1901, which provides that when county commissioners refuse or fail to appoint detectives for the protection of timber land, the Commissioner of Forestry may appoint same on request; and in this case and when convictions are obtained thereby, the county may be deprived of State aid for inefficient county detectives appointed for the same purpose.

The all important act—to the cause of forestry—of February 25, 1901, creating the Department of Forestry has already been discussed. One section of this act, Section 2, relates to the kindling of fires on forest reservations, imposing a penalty, with costs, and imprisonment in default of payment.

In order to give more thorough protection to forest lands and to render more efficient the work of the employees of the Department of Forestry, the Legislature conferred upon them, by act of March 11, 1903, the same power given to constables by the act of April 29, 1897. This gives power and large discretion, but not more than such cases usually demand.

The solution of the forest fire problem is, undoubtedly, nearer than it ever has been before; better protection is being given to timber lands than heretofore; the laws for their protection from fire are numerous and various; among all the states, Pennsylvania is yielded credit for a businesslike forest administration; and yet, notwithstanding all this, the forest fire problem is still unsolved.

Note.—Credit is hereby acknowledged for much of the information contained in this chapter regarding the reservations and forestry laws to the reports of the Pennsylvania Department of Forestry.

CHAPTER XXXII.

PENNSYLVANIA—EARLY LUMBERING.

The earliest settlers of Pennsylvania were, of necessity, lumbermen. Next to the grist mill, which furnished them with the means of subsistence, the sawmill was of the highest importance, for it supplied the means of shelter. Hand sawyers were employed at first in some sections. Bucks County, though in the earliest settled part of Pennsylvania, and one of Penn's three original counties of the present State, contained no sawmill as late as 1731, when the framed houses were covered with "nice shaved clap-boards," and "the boards for floors and partitions were all sawed by hand."[1] But, as a rule, the settlers in any section of the State almost immediately upon their arrival set about erecting the rude and simple affair that so slowly and complainingly turned out their lumber, and yet played so prominent a part in their industrial life.

Even before the arrival of Penn in 1682, the Dutch and Swedes had sawmills in the settlements on the "South River," as the Delaware was then known. In a list of articles to be sent to the colony on that river, in November, 1662, was ironwork for a sawmill, for which the sum of 450 florins ($180) was paid.[1]

The following interesting items regarding Pennsylvania's earliest sawmills are taken from Bishop's history, quoted above.

In reference to a mill existing a few years later on "Carcoon Creek," it was represented to the Upland Court, in March, 1678, that in consequence of the land being daily taken up around it, it would soon be left destitute of timber, and the Court therefore ordered 100 acres of land to be appropriated for its use.[2] The Swedes also had a mill, supposed to have been a sawmill, in Frankford [now a suburb of Philadelphia], before the landing of Penn. It stood near the house of William Kinsey, the first erected in that place.[3]

A sawmill appears to have been built for the use of the colony by the first settlers under the Proprietary, soon after their landing. In a letter to the Free Society of Traders in 1683, giving an account of Pennsylvania, William Penn alludes to their sawmill for timber, and the glass-house, as being "conveniently posted for water carriage."

Richard Townsend, who came from England with Penn, and built the first grist mill within the present limits of the city [Philadelphia], also erected a corn and saw mill on Chester Creek, in Delaware County.

"This mill," he says, "I brought ready framed from London, which served for grinding corn and sawing of boards, and was of great use to us." The mill referred

[1]"A History of American Manufactures," Vol. I, by J. Leander Bishop, 1868.
[2]Hazard's "Annals of Pennsylvania," 1850.
[3]Mem. of Historical Society of Pennsylvania, Vol. II., p. 163.

to by Penn appears to have been the joint property of himself, Caleb Pusey, Samuel Carpenter and others, probably including Townsend, by whom it was erected and superintended. The iron vane, with their initials, which surmounted it, is still preserved.

Although corn mills were built in considerable number by the first German and English settlers, sawmills do not appear to have been numerous in the neighborhood of Philadelphia. They were said, a few years after the landing, to have a sufficiency of mills, and in different places; but sawmills are not particularized. Hand sawyers are mentioned as in demand in 1698, and received, for sawing pine boards, six to seven shillings per hundred. The price for the same labor in 1705 was ten shillings, which would indicate an increased demand for lumber without a proportionate decrease in the cost of production. Boards were then ten shillings per hundred; shingles, ten shillings per thousand; timber six shillings the tun.

An interesting and unique bit of legislation regarding the early necessity of a sawmill on the Schuylkill River is recorded in Hazard's "Annals of Pennsylvania," the date of the decision being 1678: "It being very necessary that a mill be built on the Schuylkill, and there being no fitter place than the falls called *Captain Hans Moonson's Falls*, the court are of the opinion that either Hans Moonson ought to build a mill there, (as he says he will) or else suffer another to build, for the convenience of all parts." Whether Hans ever fulfilled his promise or not we do not know.

A small book—with a large title—published in 1698, furnishes some valuable information regarding the early industries of the Province of Pennsylvania in the Seventeenth Century. It bears the rather formidable title of "An Historical and Geographical Account of the Province and Country of Pensilvania; and of West-New-Jersey in America." Its author is Gabriel Thomas. At the bottom of the title page is the following: "*London*, Printed for, and Sold by *A. Baldwin*, at the *Oxon Arms* in *Warwick-Lane*, 1698." The following excerpts from this book are given verbatim, including the peculiarities of punctuation and capitalization:

And for *Carpenters*, both *House* and *Ship*, *Brick-layers*, *Masons*, either of these Trades-Men, will get between Five and Six Shillings every Day constantly. . . . *Sawyers* get between Six and Seven Shillings the Hundred for Cutting of Pine-Boards. . . . The Rule for the *Coopers* I have almost forgot; but this I can affirm of some who went from *Bristol*, (as their Neighbours report) that could hardly get their Livelihoods there, are now reckon'd in *Pensilvania*, by a modest Computation to be worth some Hundreds, (if not Thousands) of Pounds. . . .

They have Curious Wharfs as also several large and fine Timber-Yards, both at *Philadelphia*, and *New-Castle*, especially at the *Metropolis*, before *Robert Turner's* Great and Famous House, where are built Ships of considerable Burthen. . . . They have very Stately Oaks to build Ships with, some of which are between Fifty and Sixty Foot long, and clear from Knots, being very straight and well Grain'd. . . .

The *Water-Mills* far exceed those in *England*, both for quickness and grinding good Meal, their being great choice of good Timber, and earlier Corn than in the aforesaid Place.

The "Chester Mills," including a sawmill, in part belonging to the estate of Jonathan Dickinson, on Chester Creek (probably in the present

Delaware County), were advertised for sale in 1723.[4] In Franklin County Joseph and Benjamin Chambers located at "the Falling Spring" about 1730 and at a later date built a saw and grist mill.[5] At Friedensburg, near Reading, Berks County, there was still in operation in 1904 an old sawmill that was erected about 1735. It was called the old Bertolet mill, and was built and put into operation by Jean Bertolet over 170 years ago. The mill, together with an old house, was bequeathed through generations to members of the same family, the last owner bearing the name being Israel Bertolet, the fifth in succession, and who was still operating the mill as late as 1904. The Oley hills and the valley from which this old mill drew its supply of timber are famous in history. Daniel Boone's ancestors lived but a short distance from the Bertolet mill.

Prior to 1737 Nathaniel Irish was located near the mouth of Saucon Creek, Northampton County, where he built a grist and saw mill.[5]

In 1760, the assessors reported forty sawmills within the county of Philadelphia (which at that time included the present County of Montgomery, also). Pine, oak, hickory, walnut and other lumber, either sawed near the city, or rafted down the Delaware, Schuylkill and other streams, was always abundant in the market of Philadelphia, and was exported in considerable quantities. Mills for its manufacture were speedily multiplied on the rivers in the interior, where timber abounded. The exports of boards and scantling from the port of Philadelphia in 1765 were 783,000 feet; the value of which, at £3 10s per thousand, was £2,470. Staves, heading and shingles were exported in the same year to the value of £28,450. The exports of planks and boards in the years 1772, '73 and '74 were, respectively, 1,724,000, 4,075,000 and 3,309,000 feet.[4]

Wayne County had a sawmill previous to 1762, for by that date a settlement in that county had grown to a village of thirty dwelling houses, which were comfortable log houses covered with white pine shingles or boards.[5] Two other sawmills within the present boundaries of this same county are spoken of at a later date, in John Lincklaen's journal, under date of Wednesday, August 17, 1791, as follows:

> Samuel Preston, quaker, & manager of Mr. Drinker's land, received us very politely in his log house, & gave us bacon and good chocolate. He began the Stockport [now in Wayne County] settlement two years ago—he has now two sawmills & another grist mill, he values each at 160£. . . . He employs from 20 to 30 Workmen both for his mills and for cutting roads of communication, he pays them from 3ℨ to a Dollar a day besides their board, he gets sometimes men for 50ℨ a month & board.
>
> He sends his boards by the Delaware to Philadª, & bateaux of two tons, which are usually 7 days on the way, the expense of which he reckons at 20£.

Lycoming County had a sawmill as early as 1773. Bradford County's

[4] "A History of American Manufactures," Vol. I. by J. Leander Bishop, 1868.
[5] "History of Pennsylvania," by William H. Egle, 1883.

first sawmill was built by Anthony Rummerfield, on the creek which bears his name, before the Revolutionary War; another old sawmill in this county was erected in 1783. Schuylkill County also had a sawmill previous to the Revolution, which was erected by Martin Dreibelbis where Schuylkill Haven now is, on Schuylkill River; this region had several sawmills before 1800—one stood where Pottsville is now located, and another was put up by George Orwig near the present St. Clair, all three of these places being within a few miles of each other. Allegheny County had a sawmill (probably two of them), in 1776. In 1786, within thirty-nine miles of the borough of Lancaster, Lancaster County, one-third of whose population were engaged in manufacture, there were sixteen sawmills. In 1789, at the mouth of Cascade Creek, in Susquehanna County, Samuel Preston, of Wayne County, mentioned in John Lincklaen's journal quoted above, erected a sawmill, dwelling houses, etc., naming the place Harmony. Crawford County, in the vicinity of Meadville, had a sawmill as early as 1789, from which the settlers were supplied with lumber and the surplus was rafted to Pittsburg. Wyoming County had a sawmill in 1793, and Warren County possessed one prior to 1795. This mill was owned by the famous Indian, Cornplanter. Erie County doubtless had sawmills before the close of the Eighteenth Century. In 1795 there were but four families living within what now comprises that county. The first mill (kind not designated, but probably a sawmill) built in the Erie Triangle was at the mouth of Walnut Creek; there were two other mills built in what is now Erie County at about the same time—one by William Miles, on the North Branch of the French Creek, and the other by William Culbertson, at the outlet of Conneautte Lake, near Edinboro. Jefferson County's first settler, Joseph Barnett, erected the first sawmill. He went from Dauphin County in 1797, penetrating the wilderness of the upper Susquehanna and passing between the sources of that river and the Allegheny. He settled at a place which he named Port Barnett (doubtless the site of the present village of Garrison), where Sandy Lick Creek and Mill Creek join, forming Red Bank Creek. Here he built a sawmill, some time between 1797 and 1799, nine Indians of the famous Cornplanter's tribe assisting him in raising his mill. The lumber sawed at this mill was rafted down to Pittsburg, where it brought $25 a thousand feet. McKean County had a grist and saw mill erected in 1798 by a Mr. King at a settlement then called Ceres, which, it is inferred from an account of the settlement, was doubtless near the present village of Ceres, which lies across the State boundary line in Allegany County, New York.

The date of Clarion County's earliest sawmill was 1805. Some of the northern and northwestern counties of the State, that later cut so prominent a figure in the lumber business, were not settled until 1800 and later,

and, consequently, the erection of their sawmills was at much later dates than those mentioned. In many instances it was the superior growth of timber that drew settlers from the older sections to the untried wilderness. The sufferings that these sturdy pioneers underwent are almost inconceivable at this day, and their recital alone would fill a large volume. They suffered the attacks of wild animals in search of food and of the savage Indians in search of white men's scalps; many died from the rigors of the climate; for clothing they wore the skins of beasts; for food, at times they were compelled to mix the bark of trees with their corn meal so it would hold out the longer, and also at times they dug up the potatoes they had planted—so near were they to starvation. Furniture they had none, except rough boxes and boards; some rode, if fortunate enough to possess a horse, or walked, miles (in some cases 100 miles) to the nearest grist mill to have their handful of corn ground, while others did their own grinding by means of the hollowed out stump of a hardwood tree and a stone, or a wooden pestle. But in spite of their hardships they persevered, and within a short time thriving villages dotted the forests, and the hum of the sawmills and the shouts of the raftsmen told of the business the forests were creating—a business that later placed Pennsylvania at the head of the great lumber producing states of the Union.

In many sections of the State the once magnificent forests are entirely cut away and grass grows in the streets of once busy villages whose sole industry was lumbering. This is not strange when it is considered how prodigal the early settlers and lumbermen were of the forest's wealth. The "logging bee" or "log rolling" of the pioneers illustrates one phase of this prodigality. In order to clear spaces for their farms the settlers cut down the trees—the now highly-prized white pine and black walnut as well as the other species—calling in the neighbors to help, as the fine specimens of those days were more than one man could handle alone. After the trees were felled, the logs were cut into suitable lengths, rolled into heaps and burned. Thus, what would today bring thousands of dollars was then considered only something to be gotten rid of, and to feed the bonfires. The lumbermen did their share in making away with the excellent timber of the State, and only in the latter half of the Nineteenth Century did they awake to a realization of the fact that the timber growth could be exhausted. The *Lumberman's Gazette* of July 27, 1876, contained an article on the destruction of white pine; and what is true, in this respect, of this species is true also of hemlock and the hardwoods. The article was in part as follows:

Lumber operators and consumers in this State are awakening to a knowledge of the important fact that the pine timber resources of Pennsylvania are not inexhaustible, as they have apparently been long considered. The State was one of the leading pine pro-

ducers in the Union. The dense forest bordering the Susquehanna and traversed by its many tributaries; the mountains of the Monongahela Valley, and, in fact, the tall and majestic trees that covered thickly much of the area of whole counties in the State, were, a few years ago, thought to contain pine enough to amply comply with the law of supply and demand for the present, and to furnish timber for the future, however distant. That impression the march of events has thoroughly dispelled. The forests of the Delaware have yielded no pine for years, and the resources of the timber regions of the Allegheny and the Monongahela have been drawn on so largely that, in a comparatively short time, their pine forests will be exhausted. An increasing demand by interior markets and the inadequacy of the Monongahela and Allegheny counties to respond to it have awakened much alarm among the operators of the Susquehanna Valley, and they are earnestly considering means by which the recklessness of management and waste of timber, so notorious in the past, may be stopped, and the inevitable day, that is, at the best, not far distant, when pine lumbering will no longer be one of the great industries of Pennsylvania, be postponed as long as possible.

CHAPTER XXXIII.

PENNSYLVANIA—THE EAST.

The eastern section of Pennsylvania, as that term is used in this chapter, includes the region drained by the main Susquehanna River and the Delaware and its tributaries, the Lehigh and the Schuylkill. The section tributary to the West Branch of the Susquehanna, also known as the "Williamsport District," has occupied so prominent a place in the modern lumber industry that it will be given a chapter by itself, and only the most eastern section be treated of here.

The very earliest sawmills of the State, of which any record remains, were located on the Delaware River. Those of the early Dutch and Swede settlers in operation before Penn's arrival have been mentioned in a previous chapter, also the first sawmill erected by the settlers under the Proprietary shortly after their landing, and Richard Townsend's corn and saw mill on Chester Creek in Delaware County. On the same creek were the "Chester Mills," one of which was a sawmill, advertised for sale in 1723.

Following the Delaware River up from this county, Philadelphia County is the next in order. Records regarding the early sawmills of this section are meager indeed. Mention is made of a sufficiency of mills in the vicinity of Philadelphia a few years after the founding of that city, but sawmills are not particularized; nevertheless, that there was an early extensive trade in lumber in this region is certified by the numerous references in old records and books to the building of ships, the wages of hand sawyers, the prices of boards, shingles, timber and staves, and the exports of timber and lumber. As has been mentioned previously, the assessors reported forty sawmills in the county of Philadelphia in 1760; but the Philadelphia County of that day was much larger than the present one, as it included then what is now Montgomery County, which was not separated from Philadelphia County until the year 1784.

Bucks County had no sawmill as late as 1731, at which time the inhabitants were still sawing their boards by hand. This seems strange when it is considered that neighboring counties had sawmills nearly a half century previous.

Nathaniel Irish settled, some time before 1737, in Northampton County, near the mouth of Saucon Creek, on a tract of 290 acres, to which he afterward added 500 acres. At that place he erected a saw and grist mill.

At the present time South Bethlehem, having a population of over 13,000, situated on the Lehigh River, is the chief lumber market of Northampton County. There were in 1907 five concerns doing a lumber business in that city, one of them being a lumber broker.

In Monroe County, Stroudsburg, on a small tributary of the Delaware and near the famous Delaware Water Gap, where that river forms a gorge 1,400 feet deep through the Kittatinny or Blue Mountains, is the principal lumber town. Its population is only 3,450, and it contains four firms engaged in the lumber business.

PIKE AND WAYNE COUNTIES.

Pike County, which today cuts very little figure in the lumber business, once occupied an important place in that industry. One historian,[1] writing twenty-four years ago, has the following to say of this county:

> One and perhaps the most valuable resource of the county has nearly disappeared from its borders. At an early date the whole county was covered with a dense forest of white and yellow pine, oak, ash and hickory, while three or four of the western townships could boast of having the best hemlock land in the State; in fact, one was named Green, from the circumstance that the foliage of the forest never changed. A few years ago sawmills dotted every mountain stream; lumber, manufactured and in the log, covered the banks wherever an eddy could be found suitable for rafting, and in the spring and fall a majority of the male population were floating their hard earned products down the Delaware in search of a market.

As illustrating the superiority of the timber growth of this county, the following, written from Dingmans Ferry, Pike County, is quoted from a New York paper of March 22, 1885:

> Moses C. V. Shoemaker, of this village, has one of the newest houses in Pike County, but its floors are laid with what is, doubtless, the oldest manufactured lumber in the Union in actual use for a similar purpose. The boards are made from yellow pine lumber. They are an inch and a half thick and almost two feet wide. The trees from which they were cut were felled along the Delaware River at Dingmans more than 160 years ago. The boards were sawed out by hand by ancestors of Mr. Shoemaker and were used as the floor in a stone house which they erected in 1724. This building also served as a fort, those early settlers being constantly exposed to Indian raids. The ancient structure was demolished about a year ago to make room for the new Shoemaker residence. It was in as good condition as when first built. There was not an unsound stick of timber in it, and not one which had not been in it ever since the house was built. No lumber like the floor boards could be found in any lumber yard of the State today, for native yellow pine is now entirely extinct, and yellow pine lumber two feet wide and an inch and a half thick would be almost worth its weight in coin. When the old floor was taken out of the stone building a wealthy Philadelphian, who was spending the summer at Dingmans, offered Shoemaker a price for the boards which would almost have paid for the new house, but he refused to part with them and used them in his new residence. To all appearances they are good for use for another century and a half. From the timbers in the old stone house over 100 pounds of wrought iron nails were taken. They were four inches in length, and had evidently been made with rude

[1] "History of Pennsylvania," by William H. Egle, 1883.

implements. The work of forging must have been done on the spot, as there was no place nearer than the Minisink settlement, near the present site of Port Jervis [across the river in Orange County, New York where the nails could have been obtained, and that was twenty-four miles up the river.

Wayne County had a sawmill prior to 1762, and in 1791 Samuel Preston was the owner of two sawmills in that county, regarding which further details may be found in Chapter XXXII of this work.

SUSQUEHANNA COUNTY.

So far as is known the section now comprising Susquehanna County had not, until 1787, a civilized inhabitant. In the fall of that year there were three families living at Great Bend, Great Bend Township, on the Susquehanna River.[2]

Josiah Stewart lived at Great Bend some time previous to 1807, during which year he advertised for sale "a valuable plantation at the Great Bend of the Susquehanna." He afterwards moved to "Snake Creek," within a half mile of the State line, where he erected and operated a sawmill, later returning to Great Bend.[3]

In 1873 there were in the immediate vicinity of Great Bend five steam sawmills, cutting on an average 5,000 feet of lumber a day, besides numerous water power mills, cutting altogether probably 500,000 feet a year.

In 1789, at the mouth of the Cascade Creek, Samuel Preston, of Wayne County, mentioned above, cleared several acres, erected dwelling houses, a sawmill, etc., anticipating a large settlement, and named the place "Harmony"; but it was not until 1809 that the township of this name was organized.[2] John Comfort, who arrived in 1808, built a sawmill in Harmony Township prior to 1812.

In 1820 there were thirty voters in Auburn Township, and during the next five years seven others arrived, two of whom, Milton Harris and Simeon Evans, had sawmills. In 1873 Auburn had six sawmills. At that time Tuscarora Creek (which rises in this township, crosses a corner of Bradford County and empties into the Susquehanna near Skinners Eddy, Wyoming County, ten miles from its source), with its tributaries, furnished power for fifteen sawmills, two shingle mills, one planing mill, and one cabinet manufactory. Four of the mills were in Susquehanna County, one of these, at New Laceyville, manufactured 500,000 shingles annually.

The first sawmill in Liberty Township was erected in 1799, or shortly thereafter, the building of this mill being superintended by Samuel Woodcock for Robert Bound, a large land owner. Mr. Woodcock was the first actual settler in the township, and located about half a mile from the State line. In 1873 Liberty contained six sawmills.

2"History of Pennsylvania," by William H. Egle, 1883.

3"History of Susquehanna County," by Emily C. Blackman, 1873, from which the greater part of the subsequent facts regarding this county were obtained.

In 1800 Wilson Tiffany, Fallet, and Elias Carpenter erected a sawmill in Harford Township. In the early years of the settlement of this township pines were frequently found that measured four feet in diameter, near the ground, and sixty feet to the first limb.

Josiah Grant had a sawmill in Middletown Township before 1801, for in that year, according to the old records, he was taxed for a sawmill. Joseph Ross built the first sawmill in Middletown Center, the same township, about 1809. In 1843 a new sawmill was built by Otis Frost on the same site, the old one having long before "gone down." In 1816 the Canfields had a sawmill on the North Branch of Wyalusing Creek.

In 1802, or 1803, Mr. Bound erected a sawmill in Franklin Township under the superintendence of Obed Doolittle, "on Wylie Creek, in the eastern part of Lawsville; but it did not work well, and after a short trial was abandoned. Unprofitable to its owner, it was yet some help to the settlers in converting a few of their hemlock logs into slabs and boards, so much needed in the construction of their rude barns and houses." Simon Park settled in Lawsville in 1809, and soon afterward built a sawmill on Wylie Creek, which he kept running for several years. But, like many of the early mills, it served the public better than it did its owner and was eventually left to decay.

The first sawmill in Clifford Township was built by Benjamin Bucklin, on the stream which runs through Dundaff, about 1804; but William Finn's mill, on the same stream, was the first in successful operation.

Isaac and Jacob Tewksbury put up the first sawmill in the township of Brooklyn about 1805. Joshua Miles, Junior, a carpenter, went to this township in 1810, and erected two sawmills there and two in Lathrop, to the south of Brooklyn Township. In 1873 there were five sawmills in this township.

In Silver Lake Township, in 1809, Doctor Rose, a prominent man in Susquehanna County in his day, gathered about him a large number of workmen to fell trees near the lake and to construct a sawmill preparatory to the erection of his dwelling house. His enterprises were considered benefactions to those whom he employed, for he paid in cash—a rare return for labor in those days. In the '30's, in this section, a farm hand was paid but fifty cents a day. Oak plank was worth one cent a foot, and shingles $3 per 1,500.

In Choconut Township Joshua Griswold, from Vermont, and his two sons, Clark and George, built the first sawmill a few years later than 1810.

Daniel Foster went to Jessup Township in 1800. He built a framed house in 1812, and paid for his land twice, as the man he first bought of held a Connecticut title only. Mr. Foster had a sawmill, but the date of its erection is not known—probably it was previous to 1812.

Solomon Millard, one of the largest tax-payers in the town of Lenox, owned a sawmill in that township in 1813.

A newspaper writer, in speaking of New Milford Township about the period of 1819, said:

> Men then worked hard for fifty cents per day and boarded themselves; and for ox team and driver, $1 per day—the men living upon game and blackberries in their season. This was then a wild lumber country, but no outlet to markets. The market prices were: Lumber, clear pine, $7.50 per 1,000; . . . land worth from $2 to $3 per acre; and pine shingles, $1.50 per 1,000.

BRADFORD COUNTY.

The whole of Bradford County was originally covered with heavy forests, composed, in some parts, of pine and hemlock, in others, of beech and maple. There were magnificent walnuts along the Susquehanna River; black ash, birch and oak were frequently found in the forests. For many years the manufacture of lumber and shingles was largely carried on. These were hauled to the river or larger creeks, rafted, and floated down the Susquehanna to the several markets below. Every spring the river would be thickly dotted with rafts of various kinds and sizes, bearing the fruits of the winter's work, running the hazard of being stranded or being crushed by some mismanagement, to find a market at Harrisburg, Middletown, Baltimore or Philadelphia, when many times the proceeds would scarcely be sufficient to pay for the rafting and running. The first sawmill in the county was built by Anthony Rummerfield before the Revolution. Since then, there has been a time when they could be counted by the hundreds. With the disappearance of the forest, this branch of the industry has correspondingly diminished, and the greater facilities of transportation furnished by railroads have made rafting a thing of comparatively rare occurrence.[4]

Bradford County was formed from a part of Luzerne and Lycoming counties February 21, 1810. Previous to March 24, 1812, this county was called Ontario.

So far as we can now find the record evidences, the first white man who was ever in what is now Bradford County was Conrad Weiser, an Indian interpreter. He was on his way to attend a council of the Iroquois, or the Six Nations, at Onondaga, and passed up the entire length of the Susquehanna River from the bay to Tioga, the Indian town at the junction of the Chemung and Susquehanna rivers, which he reached March 29, 1737. [Tioga was probably near the present Greenes Landing. It does not appear on the maps of today.] This place was the "door" to the Indian tribes to the north in New York, and here the traveler stopped several days and noted many of the peculiarities of the Indians. His journal of this

4"History of Pennsylvania," by William H. Egle, 1883.

trip gave to the world its first knowledge of the north branch of the winding river that passes entirely across the State of Pennsylvania.[5]

Standing Stone derives its name from a high rock standing in the opposite side of the Susquehanna River, which has been a landmark from the earliest settlement of the country. The township was erected out of parts of Herrick and Wysox in 1841. Settlements were commenced in this township as early as 1774, by Anthony Rummerfield and others, on the creek which bears his name and where he erected the first sawmill built in the county.

Amos Bennett built "a little tub-mill" at the falls on Bennetts Creek, Asylum Township, about 1783 or a little later. Whether this was a sawmill or not is not known; but certain it is that the remains of a sawmill later occupied the same site.

After the land bought by the Commonwealth of Pennsylvania from the Indians at Fort Stanwix in 1784 was opened for sale in 1785, Prince Bryant bought 600 acres in Athens Township and on his land built a grist and saw mill some time between that date and 1788.

Casper Singer settled, in 1791, in "the Towandas" (including North Towanda and Towanda townships) and built a sawmill near the mouth of Towanda Creek. Abial Foster settled in this section prior to 1795, and built a sawmill which was among the first, if not the very first, on the site of "Myer's Mills," and for years this was the important milling point. Martin and Cephas Stratton and Jonathan Holcomb erected a sawmill in 1809 on Sugar Creek. William (?) Means lumbered extensively and shipped his lumber in rafts down the Susquehanna. In 1809 he built a sawmill at "Van Gorder's" on Towanda Creek, and afterward a second one at Greenwood.

Towanda village was a famous white pine center fifty years ago. Its location favored this; for, being situated on the Susquehanna River, which, with its tributaries, drains all the northeastern white pine counties of Pennsylvania and southern New York, it was a natural outlet of the white pine lumber production. In 1907 there were still four manufacturers of lumber having offices in Towanda.

Samuel Gordon built a mill (presumably a sawmill) in Wyalusing Township in 1793. The first frame house in this township was erected by Joseph Stalford in 1796, with lumber obtained from Tioga Point. On the roof of this house were hand-made shingles and hand-wrought nails. In the same year Joseph Town built a saw and grist mill.

In Canton Township, occupying the southwestern corner of Bradford County, Sterling and Hugh Holcomb are thought to have located claims

[5] "History of Bradford County, Pennsylvania," by H. C. Bradsby, 1891, to which credit is acknowledged for much of the subsequent information regarding Bradford County.

in 1795, which they occupied in the following year. Hugh Holcomb built one of the very first sawmills in southwestern Bradford County. The noted early place called the "Allen Mills," in Canton Township, is believed to have had a sawmill built by David and Stephen Allen about 1796. This mill was still in operation sixteen years ago. Orr Scovel had a sawmill in operation in this township before 1800, and Jacob Granteer built the first one on Mill Creek, a little north of Canton borough.

Ezra Goddard and his sons, Luther and Ezra, arrived in Burlington Township in 1796, bringing much wealth and money (for those days) with them from Connecticut. Soon afterward they built a sawmill in West Burlington. Another important arrival at about that time was Deacon Moses Calkins, a blacksmith from Vermont, who was much needed. He built a sawmill on Leonard Creek. In those days they had to get along without chairs in this newly settled section; but Jesse Marvin, a chair and window-sash maker came, and it was a great day in Burlington when he set up his little slow-going foot-lathe. Soon each of the more prominent families was the proud possessor of three chairs. Ephraim Blakesley had a sawmill in this township at an early day, for in 1808, while trying to put the first sawed log on the carriage of his mill, he slipped and was killed instantly.

In Wysox Township John Hinman built a grist and saw mill on the Little Wysox—the first in the township. Jacob Myer, from whom the village of Myersburg received its name, built a sawmill later, in 1802 or 1803. Later still the Woodburns had a sawmill on the Wysox.

In Monroe Township Colonel Rogers Fowler erected a sawmill in 1803, and Anthony Vanderpool, some time before this date, built a little log tub-mill, the first mill in that section. The Hewitts went to this township before 1813, where they had a mill in operation for a number of years. They did quite an extensive lumber business.

Gerard Smith built two sawmills on the Wappasening, in Windham Township, about 1805, the first in that township. At one time there were as many as twelve sawmills in this township.

The first sawmill in Smithfield Township was erected in 1806 by Phineas Pierce; the second was built by Mr. Tracy. In 1806, also, was built the first sawmill of Columbia Township, by Hurlbut and Murray Ballard. At about this time (possibly a little later) was put up the first sawmill of Ulster Township, by Charles Welles. It was burned twice and then converted into a grist mill. Samuel Campbell arrived in Litchfield Township in 1807, and built a sawmill, the first in the township. Springfield Township's first sawmill was put up by Austin Leonard in 1808.

A great source of revenue in western Bradford County in the early part of the Nineteenth Century was the potash industry. This involved

a destruction of timber that would now be looked upon as deplorable. Great quantities of trees were cut, piled and burned merely to gather up the ashes for boiling down into potash. It was worth $20 or $25 a barrel, and, being easy of transportation, afforded an important item of income.

The few remaining townships of Bradford County that have not been mentioned did not possess sawmills until later than 1810—one not until 1826. For many years the main industry of this county—as of others in the white pine region of the State—was lumbering.

WYOMING, LUZERNE AND COLUMBIA COUNTIES.

Wyoming County's first sawmill was located in Nicholson Township in 1793 on Tunkhannock Creek, a stream famous in the old lumbering days of northeastern Pennsylvania.

In Luzerne County, Wilkesbarre, though not a manufacturing center, is, nevertheless, an important lumber market. Among the most prominent local lumber concerns of this city in 1907 were the Goff Lumber Company having a planing mill; J. E. Patterson & Co.; A. Ryman & Sons; W. H. Shepherd & Son, contractors as well as lumber dealers and having a planing mill, and S. H. Sturdevant Sons Company. Besides these there are ten other concerns dealing in lumber and millwork.

In 1883 there were in Columbia County forty water-power sawmills along Fishing Creek and other streams emptying into it. They have all vanished and in their place have come no fewer than 100 portable mills, cutting an average of 3,000 feet a day. One of the well-known operators of this character is Creasy & Wells, of Bloomsburg, which operates eight mills and manufactures 10,000,000 feet of lumber annually.

SCHUYLKILL COUNTY.

In Schuylkill County among the early settlers was Thomas Reed, who located there in 1750, if not sooner; and Martin Dreibelbis had, previous to the Revolution, built a grist mill and sawmill where Schuylkill Haven now appears. During the years which elapsed prior to the beginning of the present century, the rocky hills now forming the coal districts of Schuylkill County were not considered a desirable place of residence. Upon their rugged surface no dwelling seems to have existed except the Neiman house, which was located within the present limits of Pottsville and in which the Neiman family was murdered after the Revolution. We can trace no other dwelling in this uninviting region prior to the year 1800, although an isolated sawmill had appeared here and there, and a few attempts to dig and utilize the coal had been made. A sawmill had already been built where Pottsville now is seen and George Orwig had placed another near the present site of St. Clair. The Orwig family, it is known, operated the latter mill by carrying with them a week's provisions, and thus sawed all the lumber they wished without establishing

a residence at the mill; and it is probable that other parties took a similar method at other sawmills north of Sharp Mountain, which is in the southern part of the county.

Soon after the Revolution a company was formed for opening coal mines and sawing lumber near where the town of Pottsville now is. Coal had been discovered in digging a tail-race for the old sawmill on "Norwegian Creek." The company is stated to have been composed in part, at least, of Samuel Potts and Thomas Potts (who then owned the land), General Arthur St. Clair, Samuel Baird, Thomas Rutter, Colonel Francis Nichols, Thomas Mayberry and Jesse Potts, of Pottstown, Montgomery County, and probably Major William Nichols, who lived in Philadelphia. The company found that to render the Schuylkill River navigable would require more money than could be raised then, and, after sawing some lumber to pay expenses, they settled their accounts in 1786, and "the land was taken back again by Messrs. Samuel Potts and Thomas Potts."

In 1829 Abraham Pott, a son of John Pott, Senior, had erected in his sawmill in Black Valley the first steam engine ever used in Schuylkill County. It was put up for him by Prosper Martin, of Philadelphia, and was about ten horse power [6]

FRANKLIN AND LACKAWANNA COUNTIES.

Franklin County had a sawmill some time after 1730, for at about that time Benjamin and Joseph Chambers settled at "the Falling Spring," erecting a log house and eventually a saw and grist mill.[7]

The chief city of Lackawanna County is Scranton, which has been so called since 1851. In point of development the county is not an old one for eastern Pennsylvania, but one James Leggett built a sawmill in Providence Township, now extinct, within the present city of Scranton, soon after the Revolutionary War. There were other early sawmills—among them one built by Captain John Stafford, about the year 1795, half a mile below Scranton.

The city of Scranton has never been a manufacturing point of importance but has been a considerable center not only of local trade but of lumber management, at the present time being the headquarters of a number of prominent concerns having mills elsewhere. The city is the headquarters of the Allegheny Company, which has mills and yards at Scranton, North Carolina; also of the Cherry River Boom & Lumber Company, with mills at Richwood, West Virginia; of the Lackawanna Lumber Company, with mills at Cross Fork, Pennsylvania, and of the J. J. Newman Lumber Company, with mills at Hattiesburg and Sumrall, Mississippi. The Black Creek Lumber Company has a sawmill in Scranton. Other

[6] For the information regarding Schuylkill County credit is acknowledged to "History of Pennsylvania," by William H. Egle, 1883.

[7] "History of Pennsylvania," by William H. Egle, 1883.

prominent lumber concerns in that city in 1907 were the following: The Ansley Lumber Manufacturing Company, Edward S. Jones, The Peck Lumber Manufacturing Company, Spruks Bros., The United States Lumber Company, which is an investment and holding enterprise, Washburn, Williams & Co., and the Wilson Lumber & Milling Company.

MISCELLANEOUS CONCERNS.

In the above has been given available data regarding some of the principal lumbering counties of eastern Pennsylvania. The present industry may be exemplified by a consideration of some of the principal cities of that region which, added to the paragraph regarding Scranton, indicates that the business is now largely a local one, although these cities are sometimes homes of prominent institutions which invest elsewhere, in lumber manufacturing operations, the wealth accumulated through their home trade.

In Northumberland County, Sunbury, having a population of 9,800, is quite a lumber market. The two most important concerns are the Laurelton Lumber Company, having its mills at Laurelton, Union County, and the White Deer Lumber Company, with mills at White Deer, also in Union County. Sunbury has eleven other lumber concerns, nearly all of which have planing mills.

Dauphin County contains the capital of the "Keystone State"—Harrisburg. This city has fourteen lumber dealers and two lumber commission concerns. The most important companies are the following: Estate of D. D. Boas, Perry Lumber Company, John S. Sible and the Wittenmeyer Lumber Company, having a mill at Middleburg, Snyder County.

In Lebanon, Lebanon County, a city having a population of about 18,000, H. Kalbach & Bro. have a sawmill. There are also six minor lumber dealers in this city, two of whom have planing mills.

In Lehigh County, Allentown is the most important lumber center, having seven concerns engaged in the lumber business, five of whom have planing mills.

Berks County possessed an oldtime sawmill—the Bertolet mill, erected about the year 1735 at Friedensburg, and still operating as late as 1904 under the same family name. This mill is more particularly mentioned in Chapter XXXII of this work. Reading, in Berks County, is the headquarters of two important lumber companies—Merritt Bros. and the Reading Lumber Company. There are eight other smaller concerns having planing mills in this city, besides a number of lumber dealers having a local business.

Lancaster County was at one time a thriving lumber manufacturing section, for as early as 1786 there were as many as sixteen sawmills within thirty-nine miles of Lancaster borough. In the city of Lancaster the most

important lumber concerns now are G. Sener & Sons and the Spider Lake Saw Mill & Lumber Company. Besides these there are twelve smaller concerns dealing in lumber, several of which have sawmills and several others planing mills.

RAFTING ON THE SUSQUEHANNA.

The rafting business upon the Susquehanna River, according to Franklin B. Hough's "Report upon Forestry," published in 1878, began about 1807, when two brothers named Phelps conducted the first raft of spars down that river from Owego, Tioga County, New York, which county lies directly north of Bradford County, Pennsylvania. This raft was sold at twenty-five cents a cubic foot. The rafting business continued for many years, but was declining in importance every year at the time when Hough wrote. Its best days were from 1833 to 1840. Hough continues as follows:

> From 2,000 to 2,500 rafts of hewn timber are started every year from the headwaters, and 1,000 to 1,200 and sometimes 1,500 reach tide-waters. They will average 6,000 cubic feet to the raft. There are also a few spar rafts. The principal distributing point is at Port Deposit, in Maryland, on the east side and not far from the mouth of the river. The largest part goes to Philadelphia, and the next largest to New York, the rafts being towed through the canals. Baltimore and other markets receive the rest.
>
> In former days a great number of board-rafts came down with the spring floods. They contained about 54,000 feet board measure, but now, with increased facilities, 65,000, 70,000 and even 80,000 feet can be floated on one raft. About 20,000,000 feet of boards, manufactured in mills above, are brought down every year in rafts and boats, and distributed at Port Deposit, and from 7,000,000 to 9,000,000 at other points. But few shingles are brought down. . . . Formerly, large amounts of staves and heading were brought down upon rafts, but now the amounts are much reduced and they are brought in boats. . . .
>
> It may not be unprofitable to notice how prices have changed at Port Deposit since an early period of the lumber trade.
>
> From 1833 to 1835 the average price of common pine lumber was $7 to $8 per thousand feet, the highest being about $10.50. Now [1877] boat lumber averages about $22. The best grades, then $18 to $20, are now $35 to $42.
>
> Square pine timber, then worth 5 to 8 cents or sometimes 10 to 12 cents the cubic foot, now sells at 16 cents, and in 1873 it was 20 to 25 cents. White oak hewn timber, then 12 to 14 cents, is now 20 to 22; and in its highest rates of 1871–2 it was 30 to 35 cents.

As late as 1878 there was an estimated amount of 200,000,000 feet of logs and lumber supplied annually by the Delaware River to the lower markets, about one-quarter of which was in the form of round logs, and the balance manufactured stuff. In that year the price for both logs and manufactured stuff was $8 a thousand. The previous year Delaware River logs brought $4.50 and scantling $6 a thousand.

THE DECLINE OF HEMLOCK.

To give a correct idea of the extent to which lumbering has been

carried on in the past in the eastern section of Pennsylvania now under discussion, an article which appeared in a leading lumber paper in 1881 is quoted herewith:

Several years ago the hemlock standing in northeastern Pennsylvania was thought to be well nigh inexhaustible, wiseacres predicting that it would be decades, and even centuries, before it would be utilized. They were not wise enough to see in the distance the industries that would demand it, and now, a few years after these predictions were made, we find that there are not two trees standing where there were then ten. As long ago as we speak of, these lands were of little value. Many of them are mountainous, and of little or no use for agricultural purposes, and the timber was not considered worth enough to buy.

The change in this state of things will be appreciated when we say that now from $30 to $50 is paid per acre, stumpage, and when it is not bought by the acre, $2 per thousand is paid, not including the bark. This is a rapid advance in value, coming up from nothing almost, to ten times as much as the best pine lands in the Northwest could be bought for ten years ago. The poorest figurer can see, however, that the value is not a fictitious one, and that the investment pays a good profit. The heavily timbered land yields 25,000 feet to the acre, but the average can be placed at from 15,000 to 20,000 feet. Ten dollars per thousand is obtained on car. There is one cord of bark to 1,500 feet of lumber, worth at the tanneries $6.50 per cord, or $4.50 piled in the woods. There can not be an overproduction of bark, the large tanning establishments readily buying every cord that is offered.

Some of the lumber goes to New York and Philadelphia, but the larger proportion of it is used for mining purposes. The latter is cut largely into three-inch plank. There is no grading, as the poorest quality of sound timber can be used advantageously. Occasionally a log is discarded before it reaches the saw on account of rot, but everything else is worked up. The amount of plank and timber that is called for by the mines is surprising. The mills have large orders at all times on their books. Many props are used, and the demand increases as the shafts extend under the mountains.

The largest body of hemlock still standing in the northeastern part of the State is in Wyoming County, much of which, with present advantages, is difficult to get to the mills. Capitalists have seen the advantage of investing in these hemlock lands, and they are now mostly in few hands. There are bodies of considerable size throughout the northern part of the State, but as the streams are unimproved many of them are, as yet, inaccessible.

MILLS OF TODAY.

A word about the present mills of eastern Pennsylvania may not be inappropriate here. Of these there are many, a large number being portable mills and the majority small ones. They cut mostly second growth timber and such as the farmers furnish them. Among the largest mills of this section may be mentioned the following: Creasy & Wells, Bloomsburg, Columbia County, having a capacity of 20,000 feet a day and cutting white pine, hemlock, oak, chestnut and other hardwoods; Zearfoss-Hilliard Lumber Company, Easton, Northampton County, capacity 15,000 feet a day, cutting mostly hemlock, but some white pine and hardwoods; Laquin Lumber Company, Laquin, Bradford County, capacity 135,000 feet, contract sawing for the Central Pennsylvania Lumber Com-

pany, of Williamsport, cutting over 33,000,000 feet of hemlock a year, some white pine and hardwoods; Trexler Stave & Lumber Company, Limited, Mertztown, Berks County, having two small mills; H. C. Hower & Bro., Port Royal, Juniata County, cutting 3,000,000 feet of oak a year, other hardwoods and white pine; Monroe H. Kulp & Co., Shamokin, Northumberland County, mill at Lewisburg, Union County, which cut, in 1906, 2,000,000 feet of white pine, some hemlock and hardwoods, and closed up its operations in this section preparatory to removing to Oldtown, Maryland; Ayers Lumber Company, Towanda, Bradford County, mill at Lamoka, same county, capacity 10,000 feet a day, cutting mostly hardwoods, with a little hemlock; M. H. & G. H. Welles Lumber Company, Wyalusing, Bradford County, capacity 30,000 feet a day, cutting 2,700,000 feet of white pine a year, with hemlock and hardwoods.

CHAPTER XXXIV.

PENNSYLVANIA—THE PHILADELPHIA MARKET.

The history of the lumber trade in Philadelphia and in the stalwart Keystone State is co-extensive with the history of the municipality and Commonwealth. The very site of the city was cut out of the virgin forest found by the earliest settlers, and the forests of the State have produced timber that has made its way into every market of the Old and New worlds. As related in the preceding chapter, the records show that more than a century and a half ago, before the vast West was anything more than an unknown wilderness, the lumber industry was carried on in Philadelphia in a primitive way, and in the years that have since elapsed Pennsylvania has produced billions of feet of timber and has still billions uncut. Continuity of lumber production led to continuity of business enterprises founded thereon, and now in the city are four firms which have been engaged in the one occupation for periods ranging from three-quarters of a century to over 150 years, handed down from generation to generation, from father to son. Such is the distinctive claim of the Quaker City.

It is true that Philadelphia is no longer the center of the trade, a position that it once held. Physical reasons alone account for this. At one time, because of its geographical location, the city was not only a place of consumption but of distribution as well, but today it is mainly the former. The North, East, South and West each has its sections of production and distribution, and the ramifications of the business in the Twentieth Century do not permit of its restricted direction.

The lumber trade of the Quaker City of today is no small fraction of the city's great wealth. Altogether there are about sixty yards and planing mills and a like number of wholesalers and manufacturers whose business is carried on in all the states and territories. The volume of business done in a year amounts to millions of dollars—it is utterly impossible to give figures at all accurate. This is particularly true of the wholesalers, though in the case of the yardmen the business done in 1907 is said to have approximated $15,000,000. Thousands of persons are given employment in the various yards, offices and mills, and the prosperity of the times is nowhere better reflected than in the constantly increasing additions to the ranks of this army of workers.

There is evidence that Philadelphia was a center for hardwoods as early as 1800 and that logs were then imported. In an old file of the

North American, the oldest daily newspaper in Pennsylvania, founded in 1784, is found, under date of January 2, 1804, the following quaint advertisement:

Wanted to charter, a sloop or schooner. Bound to one of the West-India Islands to proceed from thence to the Bay of Honduras, there to receive for this place from thirty thousand feet of mahogany with log-wood sufficient for storage. Jacob Downing, No. 119 North 4th. street.

From the same Bay of Honduras still come to the Delaware, and to at least one big yard, cargoes of mahogany, and Philadelphia capital is invested there; but the cargoes that reach the Philadelphia market at this time are not of the 30,000-foot variety. Cargoes of that size would now be distributed in a day.

EARLY SHIPBUILDING IN PHILADELPHIA.

The shipbuilding industry of Philadelphia early acquired prominence, as the following from Watson's "Annals," published about 1857, testifies:

Philadelphia has long been justly renowned for her superior excellence and elegance in shipbuilding. None of the colonies equaled her; and, perhaps, no place in the world surpassed her in her skill and science in this matter. At the present day [1857] other cities of the Union are approaching her excellence. When Samuel Humphreys, Senior, was visiting England he was offered, it is said, a great sum to remain and execute models for the British navy. In early times they used to construct at Philadelphia great raft ships, of much larger dimensions than the late renowned ones from Canada, called the *Columbus* and *Baron Renfrew*, and which in the present day have been regarded as nonpareils. A little before the War of Independence the last raft ship was built and launched at Kensington.[1] Our great raft ships were generally constructed for sale and use in England, when our timber was more plentiful and cheaper. They would carry off "800 logs of timber, competent to make six ships of 250 tons each." An eye-witness, who saw one of these mammoth fabrics descend into her destined element, said she bent and twisted much in launching, but when on the water looked to the eye of the beholder much like another ship in form, etc.

Before the Revolution a former raft ship, bearing the name of the *Baron Renfrew* (probably the largest ship ever built, being upwards of 5,000 tons and double the measurement of an ordinary seventy-four), made her voyage safely into the Downs. [The modern Pacific Coast raft often carries 8,000,000 feet of logs.] But the pilots being unwilling to take her into the western channel, because of her great draft of water, undertook to carry her around the Goodwin sands, where, being unable to beat up against the strong north wind, got her ashore on the Flemish banks, near Graveslines, where she was broken up by the heavy sea. Nearly all her cargo was saved. Rafts of great size were made of her lumber and towed into France, and into the River Thames. Some of them contained fifteen to twenty thousand cubic feet of timber. On the top of one of them, which was towed to London, was the foremast spar of this mammoth ship—being a single tree of ninety feet in length, and was there regarded with great admiration, as a noble specimen of our American white pine. . . .

As early as the days of the founder, the shipyard of William West was begun at Vine Street. The activity of shipbuilding there, by which he enriched his posterity, was wonderful. He had generally more orders than he could supply (so says his late

[1] "One was launched in 1774–5, at Slater's wharf, a little south of Poole's bridge, and was navigated by Captain Newman."

grandson) and mostly recorded for English and Irish houses abroad. William Penn's letter, of 1683, says, even then, "Some vessels have been built here and many boats."

In July, 1718, Jonathan Dickinson writes to his correspondent, saying, "Here is great employ for shipwork for England. It increases and will increase, and our expectations from the ironworks forty miles up Schuylkill are very great." The same writer calls a ship sometimes a "galley," and a small vessel a "hoy"—of such he speaks as being used in navigating the Delaware, and going to Cape May for cedar rails, etc. . . .

The frigate *United States*, built at Philadelphia by Humphreys, was the fastest sailing ship ever constructed anywhere.

Philadelphia and vicinity also led all the other cities and sections of the United States in iron and steel shipbuilding. From a mechanical standpoint the father of the present United States navy was John Roach, who in 1871 established the Delaware River Iron Shipbuilding & Engine Works, at Chester, below Philadelphia, where he constructed the first ships for the new navy. That establishment is still in operation. The greatest factor in the construction of the new navy is the William Cramp Sons Ship & Engine Building Company, which was established in Philadelphia in 1830. This is simply the leader in an industry which is the successor in these days of iron and steel of the wooden ship industry of an earlier day.

LUMBER YARDS AND MILLS.

"Board yards" was the title bestowed upon the lumber yards early in 1800. In Watson's "Annals," quoted above, is found the following:

It is only within the last thirty-five years that board yards and wood yards have been opened in the western part of the city. In former times they were universally confined to the wharves above Vine Street. When the first two or three persons opened board yards in the west it excited surprise and distrust of their success. The north side of Pine Street, from Fifth to Sixth streets, was once a large board yard, and another was on the south side of Spruce Street in the same square. These were among the first inland yards. There was a large board yard on the lot of Ross's store, in Front Street below Walnut Street. There was also the board yard of McCulloch & Patterson on the wharf between Walnut and Spruce streets, in 1775.

The city's principal streets bear the names of woods—Chestnut, Walnut, Locust, Spruce, Pine, Cherry, Cypress and others, showing the presence of these tree species in the city in the olden days.

Beginning about 1800, the bulk of the lumber business was conducted along the Delaware River front. In those days nearly, if not all, of the lumber or timber reached the city in rafts. It came down the Delaware from the Pocono Mountains, in Monroe County, or down the Susquehanna and into the Delaware by way of the old canal, from the Moosic Mountain region. The white pine was the fine, soft cork pine for which Pennsylvania was famous but which is now practically cut out. The hemlock was also of the best grade. A few small sloops brought "sappy" pine from lower Jersey or the peninsula. The hardwoods, such as ash, beech, birch and maple, topped off the white pine and hemlock rafts. Several

of the old-time lumbermen remember when, as boys in the old Kensington district, they played on these rafts in their bare feet.

FORMER PRICES OF LUMBER.

The white pine was in but three grades—panel, common and cull—as compared with the multitudinous divisions of the present. The panels were without knots, curls or sap and were sold for $30 a thousand; and the dealers made money out of them at that. This same grade today would bring $120 or more. The next lower grade would now bring $25 to $50 at retail, while the culls would sell for $20 or more; and they were notably better than culls as the lumbermen of the present day know them. Twice a year would the yardmen (retailers and distributors) travel to the Delaware Water Gap, Marietta, Columbia or Port Deposit, Maryland, to do their buying for the season. Big stocks had to be carried, for navigation was not open all the year around and railroads counted for little.

The growth of the lumber industry of Philadelphia, a marvelous story in itself, is, perhaps, as well exemplified in the invoice books of some of the older houses as in any other manner. As mentioned in the first paragraph of this chapter, there are in the Quaker City several lumber concerns whose business foundations were laid more than a century ago and which are yet thriving and growing houses. In one or two instances the old books, dating from a half to over three-quarters of a century ago, are preserved and greatly prized, and it is in these books that the spread of the trade and the increase in commercial values are illustrated. When compared with the prices that lumber commands today the figures in these time-stained volumes are doubly interesting.

Starting as far back as 1825 the range of values has been great in the succeeding years, though it is impossible accurately to compare the values of that early period with those of today because the grading was entirely different. In those days we find prices paid for lumber then in general demand as follows: White oak sills $13 and white oak scantling $9; oak lath fifty cents and oak posts eleven cents apiece; curly maple scantling $13; cedar shingles $15.62½, cypress shingles $7 and "Indian River" shingles $10. Yellow pine boards were bought for $9 a thousand feet, and planks at $8.25. White pine boards cost $17, 5-4 panel boards $18 and half-inch panels $15. Cherry boards, plank and scantling commanded only $13. The yellow pine in those days came from New Jersey and it was not until many years later that the product of the South came into the port in large quantities. The cypress shingle referred to was thirty inches long and was split by hand. The cedar shingles were butted at both ends and were shaved down with a drawing knife by the yard hands, who made extra money in spare hours in this way. These shingles were, perhaps, white cedars, made from logs that were dug out of the muck

swamps of New Jersey, the remains of prostrated and submerged forests of many ages ago, described elsewhere in this work. These shingles were twenty-four to twenty-eight inches long, and were the best in the market of those days, ranking with the best cypress, white pine, redwood or red cedar makes of today. Several years ago a barn was dismantled at South Bethlehem that was shingled 120 years ago with that kind of old cedar shingles. They were well worn and somewhat decayed, but they had served their purpose during the long period they had remained on the roof. No better or more convincing story could be told of cedar and cypress shingles, which are marvels of endurance as roofing material, as examples on many old houses in the Gulf country fully attest.

It was not until 1831 that the grading of white pine commenced, and then only three grades were made—panel, common, and cull. The panels included what is known as uppers today, while the common was composed of the grades now known as selects and fine common, and the culls of that date included all grades below fine common. For instance, the 1¼-inch panel boards bought in 1825 for $18 would sell today as first uppers and bring $80 and up according to quality. The cherry boards that were purchased for $13 would bring $75 and up at the present day in a yard.

In quoting these figures it must be understood that freight rates did not figure in that early period. Nearly all of the white pine, hemlock and hardwoods that reached Philadelphia was rafted there from the Susquehanna River, and a portion also came down the Delaware River. Some of the finest white pine ever grown was cut in the Keystone State and its hemlock has never been equaled, except on the Pacific Coast. These rafts were made up at the mills, floated down the streams and the entire cargo was usually bought by some yardman.

The grading of white pine in 1831 is distinctly marked by an advance in prices. Panels brought $25, common $19 and culls $11—an advance of $7 in six years, as is shown by the books of the buyers.

Going ahead ten years—1835—white pine panels brought $28, the best common brought $21, 2nd common $15, while shingles sold for $12. The next grades, box and cutting, or box and shop of today, were purchased at $8. Oak scantling brought but $11, joists $10.50 and culls $5.50. Hemlock scantling was invoiced at $9.50. Yellow pine plank cost $15 and boards $1.50 more. Sap boards are also shown as having been bought for $12. This stock is believed to have come from Pennsylvania, though in later years much sap pine was cut in the lower section of New Jersey and more in Delaware and Maryland.

White pine continued comparatively cheap for another ten years, for in 1845 panels were bought for $28, common at $21, box boards at $11

and culls, or sample boards, at $5.50. No. 1 white pine boards were bought at $24, No. 2 at $21, No. 3 at $14 and No. 4 at $9, with "scoots" at $3.50. Oak sills were quoted at $11.50 and joists at $12. Yellow pine boards at this time were invoiced at $13.50 and cedar shingles at $13. Hemlock rafters, an unknown grade today, were bought for $11 and scantling at $7.

Ten years later a further advance in white pine and other woods can be traced. Panel boards in 1855 cost $30, and the same price was paid for plank. Common brought $26, selects $22, culls $14.50 and a lower grade known as sample boards $7.25. Spruce is also quoted about this time when joist is mentioned as having been purchased for $14. The cypress shingles, 24x7 inches, cost $13, and cedar shingles thirty-two cents apiece. Hemlock scantling also advanced to $7 and yellow pine scantling had gone up in price in these ten years to $18. Ash plank cost but $24 and cypress shingles, on the other hand, cost $28.

Then came the time when the country was plunged into an internecine war, during which prices of lumber tumbled down and down as the business of the country was interrupted. But quickly did prices respond to the declaration of peace, and high values are found to have been paid for lumber in 1865. For instance, in white pine, No. 2 selects brought $48, clear $58, 5-4 boards $58, No. 2 box $32, clear 4-4 boards $50 and "pickings" $25. Spruce lumber is quoted as high as $22 and as low as $10, with boards at $7, showing a wide range of values. Spruce joist was purchased at $15. Hemlock scantling went to the high price of $17, and boards brought the same. Yellow pine boards, a whole cargo, cost $30 a thousand feet. Opposite some of the items quoted is marked "gold" in the books examined, showing that a premium was really paid for the lumber. A year later white pine panels cost $90, 1st common $75, 2nd common $55, fencing $45, flooring $42 and No. 3 common $30. Such prices are in part the effect of a depreciated currency.

Advancing another ten years, further increases are found in the price of lumber. In white pine 4-4 boards selects cost $36, picks $24, flooring $20, common $13 and culls $10. Yellow pine scantling heart face cost $26, boards $17, flooring $21.50 and culls $13. Spruce dimension in these days was purchased at $17, lath at $1.90 and pickets at $12. Hemlock, from 3x4 up to 3x9, cost $17. Hardwoods were comparatively low in price, poplar plank being bought for $18, oak boards for $55, walnut $30 and No. 1 and No. 2 8-4 walnut $65. Cedar shingles commanded the high price of $34.75.

As 1875 marked what may, not inappropriately, be termed a turning point in the lumber business, it may be well to interrupt the course of this price narrative to reproduce in full the wholesale prices current for Phila-

delphia, published in June of that year. This list of prices is herewith given as then reported by the Philadelphia correspondent of the *Northwestern Lumberman:*

White pine boards—best run of log	$24.00 @ $26.00
Ordinary run of log	22.00 @ 23.00
Selected logs	26.50 @ 28.00
Selects	42.50 @ 45.00
Edge flooring quality	28.00 @ 30.00
12-in. flooring quality	28.00
12 and 15 in. barn quality	19.00
3d common, various widths	18.00
Culls, various widths	14.00
Culls, 12-in. stock	16.50 @ 17.00
White pine flooring—selects, barn, 3d common cut	30.00
White pine 5–4, 6–4 and 8–4 plank—good run of log	25.00 @ 26.00
Selected logs	30.00
3d common	22.00 @ 23.00
White pine ⅝-in. siding—selected logs	26.50
½-in., beveled, one side and edges planed	18.00 @ 26.50
White pine ⅝-in. box boards	18.00 @ 19.00
White pine—Mich. 5–4, 6–4, 8–4, first clear, 1873 cut, seasoned	55.00 @ 58.00
Mich. 5–4, 6–4, 8–4, 2d clear, 1873 cut, seasoned	50.00 @ 53.00
Mich. 5–4, 6–4, 8–4, 3d clear, 1873 cut, seasoned	45.00 @ 48.00
Mich. 5–4, 6–4, 8–4, selects, 1873 cut, seasoned	40.00
Mich. 4–4, uppers, 1873 cut, seasoned	45.00 @ 48.00
Hemlock—boards	15.00 @ 16.00
Fencing 1¼x6—16 feet	15.00 @ 16.00
Scantling 3x4	13.50 @ 14.00
Scantling 2x3 and 2x4	17.00 @ 18.00
Shingling lath	4.25 @ 4.50
Pickets	11.00 @ 13.00
Chestnut posts—9 feet, good	.40
9 feet, culls	.30
7 feet, good	.30
7 feet, culls	.20
Yellow pine—scantling, sizes to suit	27.50 @ 30.00
5–4 No. 1 stepping	40.00 @ 45.00
5–4, 6–4, 8–4, plank	28.00 @ 30.00
4–4 and 5–4 flooring, Georgia and Florida	25.00 @ 28.00
4–4 and 5–4 flooring, heart face	32.50 @ 35.00
4–4 and 5–4 flooring, No. 1	38.00
River flooring	15.00 @ 17.00
3–4 Virginia box	10.00 @ 11.00
4–4 Virginia box	10.00 @ 12.00
5–8 Virginia box	8.00 @ 9.00
4–4 Virginia flooring	16.00 @ 18.00
Rough	12.00 @ 13.00
5–4 Virginia stepping	25.00 @ 26.00

HARDWOOD.

Oak—market overstocked.	
Walnut—4–4 to 8–4	$75.00 @ $80.00
10–4 and upward	85.00 @ 90.00
5–8	65.00 @ 67.50
Common	40.00 @ 55.00
Culls	25.00 @ 35.00
Ash—4–4 to 8–4	35.00 @ 45.00
Poplar—5–8	30.00
4–4	42.50 @ 45.00
Butternut—1st, 2d	45.00 @ 60.00
Cherry—1st, 2d	40.00 @ 60.00
Cypress shingles—24-in. Ht. Cary, dressed and bunched	18.00 guarant'd
24-inch Ht. Cary, dressed and bunched	15.00 @ 17.00
24-inch sap, dressed and bunched	12.00 @ 13.00
30-inch Ht. dressed and bunched	35.00 @ 36.00
Cedar shingles—30-inch, hand dressed	40.00 @ 42.50

The memory of nearly all lumbermen will recall the prices that obtained in 1885, and in the figures which are given are shown many changes in values compared with those before and after that time. White pine uppers were bought for $44, selects $33, common $18 and culls $15. In yellow pine, then coming in from the South to a large extent, 4-4 and 5-4 steps cost $28, merchantable $17 and rough $13.50. Spruce bill stuff

was then $18 and 3x12-20 hemlock was $9.50 and 3x12-22 $10. In the hardwoods two-inch oak sold for $40, culls for $12 and 8-4 for $55; chestnut boards for $37, 5-4 cherry $85, 5-4 poplar boards $18 and walnut boards $120.

Reaching a point twelve years ago—1895—a still more substantial increase in values is shown in comparison with those of earlier dates given. In white pine, 5-4 uppers were purchased for $52, 6-4 uppers at $50, selects at $44 and so on through the grades to culls, which brought $13. Hemlock was then commanding about $10.50, 3x12 spruce $14.50 and sap pine box boards $12.50. Ash two inches wide could be secured for $65, 6-4 maple for $32.50, 5-4 white oak $52.50, 6-4 poplar $36 and 4-4 oak $65.

A comparison of the wholesale prices of lumber in 1905 might not be out of the way when considering the figures covering the years that have elapsed since 1825. In white pine uppers 4-4 to 16-4 was sold at from $83.50 to $95; 4-4 to 16-4 fine common, $59.50 to $88.50; No. 1 cuts, 4-4 to 16-4, $43.50 to $75; No. 2 cuts, 4-4 to 16-4, $28.50 to $58; No. 3 cuts, 4-4 to 8-4, $24.50 to $30. The prices on the other grades were on the same relatively high level. Hemlock sold on a $17 basis, and prices on spruce ranged from $18 up to $25. In the hardwoods, such as oak, quartered and plain, red oak, chestnut, ash and poplar, prices showed an advance.

REMINISCENCES OF A PIONEER.

In talking to a representative of a lumber paper, in August, 1897, George Russell, a member of one of Philadelphia's oldest lumber concerns, stated that, at the time he engaged in the business, in the '30's, all the white pine and hemlock was taken to Philadelphia in rafts, floated down the Delaware and Susquehanna. White pine was sold log run, in three grades only—panel, common and culls, the latter including all barn and shop quality. The prices were $25, $19 and $11, respectively. Hemlock sold for $6.50 to $7, with no allowance for culls. Oak and ash brought from $15 to $18. Up to the early '40's flooring was worked by hand, and sawmills with a capacity of 2,000 feet to 5,000 feet a day were run by water power. Mr. Russell witnessed the building of the first steam sawmill in Philadelphia, erected in 1835, to which the carpenters were bitterly opposed, designating it as the thief that stole their bread and butter. When he first went into business there were no wholesalers in the city. Lumber was sold direct to the retail yards, of which there were five or six at the time.

Prior to 1850 the lumber district was along the Delaware, north of the present Callowhill Street. It was sometimes called the "Barbary Coast," perhaps a well deserved title because of the roughness of the characters

who brought their lumber up or down the river. These rafts of lumber were generally sold as they lay along the beach, and hemlock was bought as low as $5 a thousand. The stock was hauled away to the yard of the purchaser. After the rafting season, when the stream got low, the lumber came forward in barges, and a cargo of 20,000 feet was considered large. Some of the yards had their own small planing mill plants and all the fencing, ceiling and flooring were manufactured from the rough lumber for the use of the local carpenters and contractors. These plants were the forerunners of the extensive woodworking establishments of a later time.

OLD LUMBER FIRMS.

The sawmills, while not numerous, were large and had sufficient capacity for all the work then required. One was that of Wainwright & Gillingham, on Shackamaxon Street, and another was that of Gillingham & Garrison, on Gunner's Run. In the latter mill was sawed much yellow pine during the Civil War. There were Sydney Keen's mill on the Schuylkill, then at about Chestnut Street, and Charles Stockham's mill in Camden. This is still in operation. Another big mill was at Kaighn's Point; Michael Bouvier had a mahogany sawmill on Second Street, above Walnut, where many veneers were turned out. Churchman & Garrison also had a mill on the river front.

Some of the concerns in business in the old district before the war, and from which many of the yards of the times have developed, were Schofield & Watson, Patterson & Lippincott, Collins & Co., Samuel Bolton & Co., B. F. Taylor & Co., Gillingham & Garrison, Henry Croskey & Co., Malone & Taylor, Norcross & Sheets, D. Trump & Sons, Gaskill & Galvin, Mixwell & Woolverton, Henry C. Patterson & Co., A. W. VonUtassy & Malone and Taylor & Co. Over in Camden were Dock, Ott & DeHaven, John and Charles Stockham and Bingham & Garrison. Not a few of these men are in harness today, or their descendants are. Glancing over the list of the lumbermen in business one will find the Watsons, Pattersons, Lippincotts, Malones, Taylors, Gillinghams and others. In other parts of the city were to be found the McIlvains, Williams, Maules, Stokes, Stevensons, Mandersons, Smiths, Haineses, Weitzels and Staipers.

The city may lay claim to having two of the oldest yards in the country —those of J. Gibson McIlvain & Co., and R. A. & J. J. Williams. Clement N. Williams, the head of the latter firm, claims priority for the Williams yard. The original founder of the business was Samuel Williams, who was born at St. Austell, Cornwall, England, in 1729, and went to Philadelphia in 1733. It is on record that his sign in 1751 read: "Cradle & Coffin, Walnut Street, Samuel Williams, Joiner." At one time the Williams yard was located at Fourth and Merchant streets on the site of the Philadelphia Bourse. The changes in the style of this lumber business, significant

of the stability of Philadelphia trade, have been as follows:

1751, Samuel Williams.
1803, Samuel Williams & Son.
1809, F. & J. Williams.
1817, Samuel & Joseph Williams
1823, Joseph Williams.
1825, H. & T. Williams.
1845, R. A. & J. J. Williams.
1847, R. A. & J. J. Williams & Co.
1877, R. A. & J. J. Williams.

The present firm of J. Gibson McIlvain & Co. was established in 1798 by Hugh McIlvain, and since then the changes have been:

1798, Hugh McIlvain.
1801 to 1832, Richard & Hugh McIlvain.
1832 to 1835, Hugh McIlvain.
1835 to 1838, Hugh and James as Hugh McIlvain & Son.
1838 to 1854, James and Hugh 2nd, as James & Hugh McIlvain.
1854 to 1868, Hugh McIlvain 2nd, as Hugh McIlvain.
1868 to 1879, Hugh and J. Gibson as Hugh McIlvain & Son.
1879 to 1883, J Gibson McIlvain as Hugh McIlvain & Son.
1883 to 1888, J. Gibson McIlvain as J. Gibson McIlvain.
1888 to 1907, J. Gibson and Hugh McIlvain as J. Gibson McIlvain & Co.

The McIlvain yard at Fifty-eighth Street and Woodland Avenue is one of the largest in the city, covering fourteen acres. The firm also has what is thought to be the largest lumber shed in the country, with a capacity of 16,000,000 feet, in which is piled an immense stock of hardwoods. This yard was occupied in 1898, a move having been made from Thirty-fourth and Market streets. In the yard are 2,500 feet of trackage from both the Pennsylvania and Baltimore & Ohio railroads, and the yard also has the advantage of a competitive water rate.

Another old concern is Harbert, Russell & Co., Twenty-third Street, below Locust, of which Frank Bayle and George R. Bayle are the present members. The foundation of this business was laid in 1824 by Charles Harbert and John C. Davis. This pair, it may be mentioned, set up the first steam sawmill ever operated at Williamsport, in connection with Linnards & Co. In 1851 the late George Russell was admitted as a partner, and the firm name was changed to Harbert, Davis & Co. In 1864 Isaac D. Harbert, a son of one of the partners, was admitted to the firm and in 1883 Frank Bayle was given an interest. Mr. Russell died December 28, 1902.

Hugh Stevenson, another of the oldest lumber dealers in the city, died February 7, 1893. He began business there in 1833, retiring in 1882, leaving the business in the hands of his son, John A. Stevenson, who at a recent date still conducted it.

PRESENT LUMBER CONCERNS.

Among the leading lumber dealers of Philadelphia in 1907, with or without yards, were Alexander Adaire, Ellwood Allen, Anderson & Slonaker, Charles M. Betts & Co., Boice Lumber Company, Brawley & Smith, Owen M. Bruner Company, Daniel Buck, Coketon Lumber Company, Condon Lane Boom & Lumber Company, George Craig & Sons, George F. Craig & Co., Charles Este Company, Charles F. Felin &

Co., Geissel & Richardson, Frank C. Gillingham & Son Company, E. Guenther, Eli B. Hallowell & Co., Thomas B. Hammer, Harbert, Russell & Co., Henry, Bayard & Co., Henson & Pearson, Janney-Whiting Lumber Company, Robert G. Kay, Kirby & Hawkins Company, W. H. Lear, Robert C. Lippincott, Little River Lumber Company, W. M. Lloyd Company, Long Pole Lumber Company, Jesse Lukens & Co., W. M. McCormick, J. Gibson McIlvain & Co., Watson Malone & Sons, Otter Creek Boom & Lumber Company, Peart, Nields & McCormick Company, Philadelphia Hardwood Lumber Company, Charles S. Riley & Co., Schofield Bros., Smedley Bros. Company, George M. Spiegle & Co., Stonega Coke & Coal Company, James Strong & Co., Albert Thompson, Lewis Thompson & Co., Richard Torpin & Co., Union Railway Supply Company, George Warner, P. Elmer Weitzel & Bros., R. B. Wheeler & Co., William Whitmer & Sons, Wiley, Harker & Camp Company, J. Randall Williams & Co., R. A. & J. J. Williams, Thomas Williams, Jr., & Co., Wistar, Underhill & Co. and Wister, Heberton & Co.

Among Philadelphia lumber institutions which manufacture elsewhere were Charles M. Betts & Co., Cherry River Boom & Lumber Company, Coketon Lumber Company, Condon Lane Boom & Lumber Company, George Craig & Sons, Philadelphia Veneer & Lumber Company and R. M. Smith & Co.

Dealers represented in Philadelphia by offices or branch yards are Barker & Co. and the Rice & Lockwood Lumber Company.

Represented in Philadelphia by offices or yards are the following lumber manufacturers: Boice Lumber Company, Janney-Whiting Lumber Company, Little River Lumber Company, Long Pole Lumber Company, Otter Creek Boom & Lumber Company, Peart, Nields & McCormick Company, John L. Roper Lumber Company and Wiley, Harker & Camp Company.

Leading Philadelphia concerns which operate planing mills, sash and door and box factories, etc., often being lumber dealers as well, are The Alcott-Ross Company, Hall Bros. & Wood, S. S. Keely & Sons, G. W. Kugler & Sons, George Kyle, C. W. Nichols, T. B. Rice & Sons Company, H. H. Sheip Manufacturing Company, Sheip & Vandegrift, Swenk, Benson & Co., S. B. Vrooman Company, Watson & Robinson, A. Wilt & Sons, G. Woolford Wood Tank Manufacturing Company.

Nearly all the dealers, especially at wholesale, handle hardwoods as well as pine, hemlock, spruce, etc., but among the leading lumber dealers mentioned above, the following make hardwoods their specialty: Owen M. Bruner Company, E. Guenther, W. H. Lear, J. Gibson McIlvain & Co., The Rumbarger Lumber Company, R. M. Smith & Co., Philadelphia Hardwood Lumber Company, Philadelphia Veneer & Lumber Company, George

M. Spiegle & Co. and R. A. & J. J. Williams.

CHANGES DUE TO WAR.

The Civil War wrought great changes in the lumber business, as it did in every other industry. The first call for troops saw many of the most prominent dealers enlist in the ranks and march off—some to return to business activity, and some to die. The Government was a heavy buyer of white pine and other lumber while the war lasted and kept the lumber business from becoming stagnant. Up to this time the wholesale dealers were commission merchants. They charged fifty cents a thousand for handling; one-half of 1 percent for insurance, and 5 percent as commission. They also advanced their credit to the manufacturers, to enable them to carry on business with little capital.

The methods of doing business were changed after the war and there came the establishment of offices by the wholesalers, many of whom gave up their expensive yards. Trade increased largely, the city grew and retail yards were put into operation in the outlying districts. Yellow pine began to come into the market in large quantities from the South, and spruce from Maine was introduced. Lumber from West Virginia and the Carolinas also came in as a factor. It was an unsettled period, because of this ever-increasing volume and variety of lumber arriving.

GRADING LUMBER.

It seems almost impossible that so late as the early '70's, when demand for lumber came from a wide extent of densely populated country, there could have prevailed such a primitive and seemingly unprofitable way of cutting, grading and selling lumber. White pine was sold log run, culls out, and then sorted by the dealer into three grades—box, shop and panel. The culls were sold to the box factories. Log run, culls out, in the period from 1872 to 1880, inclusive, was sold at $24 to $26 a thousand.

Lumber was received by the retailer mill run, culls out, so he had all the special value there was in it. The only inspection of lumber after arrival was when the dealer wanted flooring and siding to satisfy the demands of his customers. To get such sorts 1x12 boards were sorted into two lots. The best, or about one-third, was converted into beveled siding, and the balance, or two-thirds, was devoted to flooring. Sometimes the wide clear was laid out for panel stock, which was shipped in the rough. Occasionally, a carload of lumber would be ordered with the direction that two-thirds, of the poorest, be made into flooring at the mill or wholesale point, and the remaining one-third be forwarded in the rough. In any case the inspector had an easy occupation, for all he had to know was the difference between the better one-third and the poorer two-thirds. There is a sharp contrast between the simple division of qualities, which gave the retailer all the "fat," and the multitude of grades into which

white pine is now divided, with the fat mainly on the side of the manufacturer and wholesale dealer. The skill, and even art, that within thirty or thirty-five years has reduced the grading of white pine almost to a science would have staggered the old-time inspector.

In those days when a builder took a contract he sent to his shop an order which ran about as follows: One thousand feet 4–4; 500 feet 5–4; 250 feet 6–4; 200 feet 8–4; 200 feet ½-inch. That description indicated all that was needed for the entire building, so far as white pine was concerned.

NEW SOURCES OF SUPPLY.

In the '70's Pennsylvania white pine began to be scarce and a new source of supply had to be found. Shipments were made from the Saginaw Valley, which marked the introduction of new grades. The dealers then sorted up their stocks, making common, culls, selects and better. The railroads aided in the movement, but with nothing like the dispatch of later days. Nearly every road had a gauge of its own, which necessitated transshipping at several points before a car of lumber reached its destination. Freight charges were frightfully high, and, until the movement grew, they were almost prohibitive. To Col. Charles M. Betts probably belongs the credit of bringing through the first car of white pine whose bulk was not broken in transit. He went West for a better grade and after much manipulation and cajoling he had the then Blue Line construct special trucks upon broad lines, and succeeded in getting several cars delivered without the pine being rehandled on the way. Only 8,000 or 9,000 feet would be carried in a car, and oftentimes 1,000 feet or more would be stolen while on the way East.

Philadelphia has always been a good market for longleaf pine, the advantage of water competitive rates having had much to do with enlarging the market for this wood. As has been stated, for years nearly all of the spruce came from the forests of Maine, but this has been largely supplanted by the product of West Virginia. In recent years North Carolina pine has been brought into the market in extremely large quantities and has created a market for itself. Many of the concerns, both wholesalers and retailers, have considerable money invested in the southern lumber trade and have done much to advance it.

CHANGES WROUGHT BY TIME.

An old-time Philadelphia lumberman about five years ago, in musing over the changes that had occurred in methods in the previous twenty-five years, commented on the fact that thirty years ago the street salesman had not yet been introduced as a lever to increase the sales of his employer. The "old timer" declared that in his day he would have closed his yard rather than feel obliged to have a salesman on the street soliciting trade. His customers came to him—he did not hunt them. In substance he said:

Twenty-five years ago Philadelphia was headquarters for planing mill work which was known all over the United States for its excellence. Today but a remnant of the mills are left, and these are working on specialities only or for local trade. Country and western competition have been the cause of this change.

Twenty-five years ago white pine was the leading factor. Today the leader is yellow pine.

Twenty-five years ago the "lumber district" was, in the wholesale as well as retail way, centered along the Delaware front extending from Noble Street to Girard Avenue. Today but four or five firms find it worth while to be located in the old wharfage district. The exhaustion of Pennsylvania forests and the use of the railroads for transportation have caused this state of affairs. Where formerly all lumber went to Philadelphia by water, now a bare 25 percent of it, and this all yellow pine, goes that way—the rest goes by rail. This change has also lessened the volume of the city's distributing trade.

North Carolina pine was an almost unknown lumber in the Philadelphia market twenty-five years ago. Owing to the diminution of the supply of white pine and the desire for a cheaper substitute, North Carolina pine, the use of which was due to a struggle for recognition fostered and encouraged by the pioneers, has almost superseded the white pine except for special purposes where only the latter will answer.

Twenty-five years ago Philadelphia was noted for the superiority of its manufactured furniture. It has lost much of its volume of business in that line (but none of its good reputation) and the furniture stores are filled with cheaper lines of western manufacture with which Philadelphia makers find it impossible profitably to compete; but the increased demand for house trim and wainscoting of this kind of wood has more than made up the loss, and the sales of such lumber have kept up wonderfully.

During the last twenty-five years the profits of the retailer have been steadily decreasing, owing in great measure to modern competition and estimating. The old-fashioned bond of sympathy formerly existing between the carpenter or builder and his favorite lumberman has been largely broken. The lowest bidder makes the sale. Another source of loss of profits to the retailer has been the increased expense of office equipment and maintenance and this has been considerable.

In yellow pine flooring, side boards were bought and worked into flooring locally. Taking it altogether, with reduction of profit, the life of the retailer is not as happy a one as it was twenty-five years ago.

Continuing the comparison of the two periods of time referred to in the above, it may be stated that the Philadelphia business directory for 1877 gives the names of 127 firms and individuals engaged in the lumber trade, of whom thirty-one are classified as "commission brokers" and the rest as wholesalers and retailers. There are in the same publication for 1902 the names of 162 lumber dealers. Of these sixty-seven may be put down as retailers, eighty-four as wholesalers, and the balance as millwork dealers and planing mill men, selling lumber upon opportunity. In 1907 there were in the city 188 wholesale, retail and commission lumber dealers and fifty-seven planing mill, sash, door and blind, box, millwork, etc., establishments.

There are no statistics of the receipts of lumber at Philadelphia beyond the last eleven years, but they are now averaging nearly 450,000,000 feet per annum. This is practically all for "consumption." In the last ten

years the localities of retail yards have materially changed, all striving to locate on railroads in the outskirts, to secure sidings.

Philadelphia is still a great wholesale lumber market. While the larger portion of the lumber going into distribution and use in this market is sold by Philadelphia wholesalers, but a comparatively small portion of this lumber is actually yarded in a wholesale way at Philadelphia. A large number of individuals, firms and corporations, making up the wholesale contingent of the market, are also manufacturers in various parts of the country, and, while the sales are made from the Philadelphia offices, the lumber is shipped direct to the retail and large consuming trade from the mills. Philadelphia capital controls the larger portion of the spruce and hemlock operations of West Virginia; others have timber lands and sawmill operations in Tennessee, Maryland, Pennsylvania and various states of the Union.

RECEIPTS OF LUMBER.

The receipts and consumption of lumber in Philadelphia have ever shown a steady tendency to increase. It must be remembered that in scanning the figures they deal almost entirely with the lumber consumed, as comparatively little is reshipped. Philadelphia is by no means a distributing center, and the figures that are given below can be considered all the more remarkable in illustrating the growth of the trade. Up until about fourteen years ago there was no record of shipments kept. The following table is given through the courtesy of Major A. T. Goodman, secretary of the Lumbermen's Exchange:

RECEIPTS OF LUMBER AT PHILADELPHIA.

Year.	Carloads.	Cargoes.	Total in feet.
1893	22,592	510	421,119,000
1894	17,460	404	327,960,000
1895	16,026	338	292,838,000
1896	18,952	360	362,437,000
1897	14,898	262	289,669,000
1898	16,721	303	330,123,000
1899	23,856	334	453,778,000
1900	18,669	411	387,326,000
1901	17,520	389	426,485,000
1902	19,866	366	508,412,000
1903	21,173	378	517,425,000
1904[1]	19,075	...	286,125,000
1905[1]	20,106	...	301,590,000
1906[1]	22,713	...	340,695,000

[1]Only rail receipts reported.

LUMBER ASSOCIATIONS.

Early in the '80's the need of an association of lumbermen to protect the trade and promote some regularity became apparent, and this resulted in the formation of the Retail Lumber Association. This was not well supported by the trade and in consequence it did not flourish. It was not until 1886 that a stronger organization—now the Lumbermen's Exchange

—was started. This was incorporated in 1886 by R. J. Watson, Reed A. Williams, Junior, E. A. Gaskill, John T. Riley, William L. Lloyd, H. R. Deacon, Charles M. Betts, W. A. Levering, Edwin H. Coane, Robert C. Lippincott, David A. Woelpper, Charles W. Henry, Charles Este and Jesse Lukens. The objects of the corporation, as expressed in the petition, and which have been carefully lived up to, are as follows:

For the encouragement and protection of trade and commerce in advancing the commercial character and promoting the general lumber interest of the city of Philadelphia; to inculcate just and equitable principles; establish and maintain uniformity in commercial usages; acquire, preserve and disseminate valuable business information, and avoid and adjust, as far as practicable, the controversies and misunderstandings which are apt to arise between individuals engaged in trade, where they have acknowledged rules to guide them.

The first president of the Exchange was William M. Lloyd, and there have followed him in office such men as Robert C. Lippincott, John T. Riley, Col. Charles M. Betts, Edward M. Willard, David A. Woelpper, Edwin H. Coane, William H. Smedley, Joseph H. Richardson, Robert G. Kay, Alexander Adaire, B. Franklin Betts, Nathan B. Gaskill, Thomas B. Rice, Franklin Smedley, Edwin F. Henson, Samuel B. Vrooman, A. J. Cadwallader, Edwin B. Malone and George F. Craig.

Among the most important work performed by the Exchange was that done about thirteen years ago when the city was infested with fraudulent dealers. These unscrupulous persons carried on business with a high hand and gave the fair name of the city a blackening with the trade of the country. A crusade was inaugurated by the lumbermen. With the assistance of the United States authorities, after a struggle of three years and the expenditure of much money, arrests were made and, following the imprisonment of five dealers, the rest were scattered. That put an end to fraud on a large scale in that city.

Besides the Exchange there are two other lumber trade organizations—the Wholesale Lumber Dealers' Association and the Retail Lumbermen's Association. These are both active bodies and have done much, each in its own line, to promote the interests of their members.

CHAPTER XXXV.

PENNSYLVANIA—THE WEST BRANCH.

While Pennsylvania has been and still is a great lumbering State, and its mills have been ordinarily more numerous than those of any other, it has had very few centers of lumber manufacture. The mills were located in the old days on available streams throughout its area, and in later days on railroads convenient to timber tracts. There have been towns with somewhat of a reputation as sawmill centers, like Towanda and Bradford, but it has had only one great manufacturing point of national reputation—the city of Williamsport, on the West Branch of the Susquehanna River, formerly known as the West Branch River and ordinarily referred to simply as the West Branch. This great producing center grew up because of its location near the mouth of a stream which drains an immense area remarkably forested. Consequently, it seems well to devote a special chapter to the West Branch and its great lumbering center, Williamsport.

In the history of the Pennsylvania lumber industry the operations on the West Branch cover more than 100 years. It was near the close of the Eighteenth Century that the sound of the woodsman's ax was first heard in this beautiful valley. From that early day to the present time it has been the principal scene of lumber manufacture in the State, though the main Susquehanna, the Allegheny and its tributaries, the Monongahela and other streams have been wonderfully prolific in forest products.

The West Branch has its source in the mountain fastnesses of Cambria County from which it pursues a winding course through Clearfield, Clinton and Lycoming counties, draining portions of Indiana, Centre, Elk, Cameron, Potter and Tioga counties on its course to Williamsport, which is located in the southern part of Lycoming. It is about 200 miles in length from its headwaters to Northumberland, where it joins the Susquehanna proper, and during its course it passes through the wildest and most mountainous portion of the State. For many years it produced white pine in enormous quantities, which was succeeded by hemlock, of which its production in later years has been almost exclusively composed.

The West Branch is very susceptible to the volume of precipitation and has taxed the ingenuity of lumbermen to bridle its angry current and render it a safe route for logs and rafts; but the skill of man brought

it under reasonable control, as attested by the billions of feet of timber that have been floated on its turbulent bosom and safely harbored in the great booms until transformed into lumber. Yet sometimes it has broken away from all restraint, and certain years are noted as flood years when hundreds of millions of feet of logs have been swept out of the booms and down the main Susquehanna toward and into Chesapeake Bay. Yet these have been the rare occurrences. The lumber business done upon it has been enormous, but for years it has been declining, until Williamsport, while still important in lumber manufacture, has dropped far below the first rank and now is comparable only with some of the minor producing points of the newer West and South.

BIRTH OF THE INDUSTRY.

The first sawmill in this section of which record has been found was put into operation about 1773. Its owner was Andrew Culbertson, who settled in DuBoistown (on the West Branch near Williamsport) as early as 1773 and there erected his rude saw and grist mill. This was burned during the Indian troubles in 1778, and Culbertson was obliged to flee. He returned afterwards and rebuilt his mill. The "Culbertson place," as it was called, languished until 1852, when the manufacture of lumber was recommenced by John DuBois (after whom the town was named) and others, on a large scale, and was continued for years.[1]

Another old mill for the cutting of timber was erected in 1792. It also was a primitive if not an insignificant affair, in which muscle was the chief power. This "mill" was located on Lycoming Creek, a few miles north of Williamsport. Roland Hall was the name of the rugged captain of industry who foresaw the need but scarcely the possibilities of the future, but who was bold enough to attempt what at that period must have been a hazardous undertaking. He no doubt realized that there would be a demand for the products of the forest with which to build the log houses in the settlement at Williamsport, then beginning to assume proportions sufficient to arouse the speculative genius of one like this pioneer lumber manufacturer.

Little is known of the actual results of this early enterprise or of its capacity, aside from the fact that logs were cut, dressed and trimmed for the trade, being largely used in the erection of houses in Williamsport and its immediate vicinity. It is inferred, however, that there was "money in it," for competition soon developed, the year 1798 witnessing the erection of two additional sawmills. Thomas Caldwell, who had a grist mill along Lycoming Creek not far from Roland Hall's plant, branched out that year by adding a sawmill to his establishment. In the same year Samuel Torbert built a mill on Battle Run, not far removed from

[1] "Lycoming County," by John F. Meginness, 1895.

the establishments of Hall and Caldwell. These "infant industries" drew their supply of raw material from the almost unbroken forests near by, the finest white pine that ever grew in the State being within their shadow. Square timber was their principal product; but, even with the unlimited resources so near at hand, the time had not come for lumbermen to begin making fortunes.

THE ACTUAL BEGINNING.

In 1838 the first sawmill was erected at Williamsport. Properly speaking, this was the actual beginning of the lumber industry which has since grown to such vast proportions, with millions of dollars invested, thousands of hands employed and with an output reaching more than 300,000,000 feet a year. This first mill was a water-power affair, and, on this account, it was early christened the "Big Water Mill," by which name it is remembered to this day. Cochran, Biers & Co., the proprietors, came from Philadelphia, having, no doubt, realized that Williamsport was the most eligible point for the location of an industry of this character. The wisdom of their choice was demonstrated in after years, when the city became the greatest lumber manufacturing point in the State, a distinction which it still enjoys, and one of the greatest in the United States.

Cochran, Biers & Co. erected their mill on a foundation of piles, which extended from the shore a considerable distance into the river. At that time it was looked upon as a very extensive establishment. Four reaction water wheels furnished the power to drive the four up-and-down saws, or "English gates," as they were called. The firm did not realize the dream of success that actuated its members at the outset. It continued to operate in a haphazard way for three years, when financial difficulties overwhelmed it and the sheriff put in his unwelcome appearance. The property passed by purchase into the possession of Updegraff & Armstrong, who operated it until 1846, when Maj. James H. Perkins acquired control.

Major Perkins came from New Hampshire and at once became the leading factor in the development of the lumber industry. He impressed his strong personality on all with whom he came in contact, and by his commanding force of character and great energy gave fresh impetus to the enterprise. His very boldness had an encouraging influence on the community, and men who had been pessimistic were easily induced to lend him their hearty support. Major Perkins foresaw the necessity for new methods in handling logs that were floated in the river and which were in constant peril from sudden freshets. He originated and constructed the great boom, which ultimately became the most important adjunct to lumbering at this point.

Major Perkins greatly improved his purchase from Updegraff & Armstrong, acquiring additional property and expanding and increasing the capacity of the plant. In 1848 he sold a half interest to John C. Cameron, of New York. They introduced a "flat gang," which was the first modern piece of machinery to be used in a Williamsport sawmill. This innovation proved a great aid and the business of the firm grew rapidly. In 1851 the partnership was further increased by the admission of Andrus, Langdon & Ransom, and the mill was further enlarged and improved at once, new machinery being introduced, including two additional water wheels to increase the power. Among the new appliances put into use were several gangs and slabbers. The new partnership was of brief duration, however, Andrus, Langdon & Ransom retiring after disposing of their interest to Hodgman, Harris & Co., who, in turn, soon withdrew and a complete reorganization followed, Nehemiah Shaw, one of the pioneers of the region, taking active charge of the operations. Mr. Shaw was a native of Warren County, New York, and he continued in the lumber business in Williamsport and Lock Haven for a full half century, his death occurring in Bradford County in 1902. When Mr. Shaw took charge of the mill in 1852, he urged the immediate introduction of more modern machinery and at once purchased a flat roller gang. This was delivered at Elmira, by rail, and from that point to Williamsport was transported on sleds. It was placed in position at once and did excellent service.

During this period Major Perkins was devoting a great deal of his time and engineering skill to the question of the proper location of the boom; and, in order that he might give it his full attention, he retired from the firm, his interest being acquired by Peter Herdic & Co., who continued the operations. Peter Herdic came from the State of New York and soon became a power in the lumber trade. His business interests grew to enormous proportions, and at one time he was the sole owner of 54,000 acres of timber land in Lycoming, Clinton, Potter, Tioga and Cameron counties. It was often said of him that he "made Williamsport," for he paved the streets, erected costly buildings, built a street railway, had the town incorporated as a city, was elected mayor and generally "flew a high kite" until the panic of 1873, when he failed with liabilities of over $2,000,000.

Herdic and his partners kept the "Big Water Mill" fairly humming with business until 1863, when it was destroyed by fire. It was never rebuilt.

FIRST STEAM POWER.

The first steam sawmill was put into operation by Peter Tinsman and George W. Quinn, who operated it from 1852 to 1855. Tinsman's ex-

perience in the lumber business was not successful from a financial point of view. George W. Quinn was for many years engaged in the manufacture of lumber, being associated with Garrett Tinsman, a brother of Peter's. After Garrett obtained control of his brother's interest, the firm of Quinn & Tinsman was formed. It carried on a profitable business for a number of years, its mill finally being destroyed by fire. Garrett Tinsman was born in Bucks County in 1808. His experience in the lumber trade of the West Branch Valley covered a period of thirty-six years. His father was a successful lumberman of Hunterdon County, New Jersey, and both Garrett and Peter Tinsman had the advantage of early practical training.

After the dissolution of the firm of Quinn & Tinsman, the latter became associated with John R. T. Ryan, as Tinsman & Ryan, and in later years was a member of the firm of Woolverton & Tinsman, which operated extensively until Mr. Tinsman's death in 1888. During the period of operations by Woolverton & Tinsman, their annual output averaged 14,000,000 feet.

The decade from 1850 to 1860 witnessed the birth of numerous lumber firms in Williamsport, some of which became famous in later years. In 1852 John and Charles Dodge built a steam mill, which in 1854 was replaced by a more extensive plant with largely increased capacity. Fletcher Coleman secured possession of this mill in 1863 and operated it nearly forty years.

In 1854 a large water power mill was erected by Peter Herdic and Benjamin Holden Taylor. In 1871 Ezra Canfield, H. C. Miller and Seymour J. Noble purchased the property, and a few years later Mr. Noble secured sole control. A steam mill was built adjacent to this property, being operated by the Taylors until 1889, when the entire plant was swept away by the great flood of that year. It was long known as the "Beaver Mills."

PROMINENT LUMBER FIRMS.

One of the firms that was destined to become famous in lumber annals had its origin in 1859. It was primarily composed of Peter Herdic, George W. Lentz, John White and Henry White. The copartnership was known as Herdic, Lentz & Whites, and it erected an extensive plant in Williamsport, operating it until 1867, when Peter Herdic withdrew. Then came the great firm of White, Lentz & White, which soon became known throughout the country. It cut from 15,000,000 to 20,000,000 feet annually, and its members became affluent. They have all passed away, leaving large estates and extensive business interests.

John White, senior member of this firm, was born in Clinton County, Pennsylvania, November 4, 1818. He early became a civil engineer,

being attached to the State engineering corps when only seventeen years of age. He assisted in surveying the vast timber tracts on the Tongascootack (in Clinton County) and the Sinnamahoning, and thereby obtained a knowledge of timber and the extent of the tracts that stood him well in later years. After giving up engineering, he went into the mercantile and grain business at Freeport, but left this to take up lumbering. Mr. White died June 3, 1890, his eldest son, Henry W. White, succeeding in the management of the estate.

Henry White was born in Clinton County, August 7, 1820. He had the advantages of early educational training, like his brother John. He read law and was admitted to the bar, but never practiced. He tried several business enterprises before entering into the manufacture of lumber. He died March 7, 1880.

The third member of this firm, George Winter Lentz, was born in Lebanon County, November 5, 1818. He had a good education, and early in life started west. He found employment in a sawmill at Logansport, Indiana. In 1838 he returned to Lebanon County and studied civil engineering, taught school and filled various clerkships. Ultimately, he became associated with the Whites and Peter Herdic. He died May 17, 1891.

Washington Righter engaged in the lumber business at Columbia, Pennsylvania, in 1834. Thirty years later he took into partnership his son, Dr. Washington Righter, Junior, under the firm name of Washington Righter & Son. Dr. Righter, in partnership with his brother, Joseph C. Righter, opened a lumber yard in Philadelphia in 1873 and continued it until 1881, when they engaged in the wholesale lumber business at Williamsport, Pennsylvania, with the principal office in Philadelphia. In 1887 the firm bought the Piper sawmill at Williamsport and operated it under the name of Righter, Benedict & Co., Limited, and, subsequent to 1889, as W. Righter's Sons & Co.

The Dodge Mills were operated by the Pennsylvania Joint Lumber & Land Company; Henry James was president and Charles L. James, superintendent. In the early '70's the mill of this company was considered one of the largest in the world, its capacity being over 30,000,000 feet annually. Several years ago the firm ceased operating. For a number of years previous a large portion of the stock used was brought to the mill by rail.

The Williamsport Land & Lumber Company, of which Elias Deemer was president, manufactured 18,000,000 feet a year.

ORIGIN OF THE SUSQUEHANNA BOOM COMPANY.

During the development of the various manufacturing interests, Major Perkins was busily engaged in perfecting his plans for a boom.

He early foresaw the necessity of providing means to keep the sawmills supplied with the products of the vast forests of pine and hemlock that covered the slopes of the valley, and decided that the West Branch could be made the great artery for floating the timber to the seat of manufacture. With this object in view, he surveyed the stream for its entire length and fixed upon a point known as the "Long Reach," a few miles west of Williamsport, as the most eligible site for a safe harbor. At this point there are about seven miles of deep water and a minimum of current, the river forming a graceful and easy curve against the mountain which forms its southern bank, and thus providing a natural and impenetrable barrier. With a line of stone-filled cribs or piers in the middle of the river he believed that any quantity of timber could be held in perfect safety on the highest floods and rafted out during low stages and delivered to the owners. Previous to this, logs that came down the river had to be watched constantly as they lay in the open stream, in constant peril of freshets; and, despite this vigilance, the loss was great, thousands of logs escaping each year.

Having perfected his plans, Major Perkins decided that they should be put into execution, and the Susquehanna Boom Company was incorporated by act of March 26, 1846. Originally, there were 100 shares of stock at $100 each. The stockholders were James H. Perkins, twenty-four shares; John DuBois, twenty-five shares; Matthias DuBois, twenty-five shares; Isaac Smith, twenty shares; Elias S. Lowe, five shares, and John Leighton, one share. On November 5, 1849, the stockholders came together for the purpose of organization. John Leighton was chosen chairman and Elias S. Lowe secretary. John DuBois was chosen president of the company. It was decided to ask proposals for the erection of cribs and piers, twelve of which were built during the ensuing year. These were added to from time to time until the structure was large enough to hold all the logs that came down the following spring. A dam was built to back the water and deaden the current.

Soon after the Susquehanna Boom Company became actively employed, the Loyalsock Boom Company was organized to provide for the logs that passed the former structure and which had to be rerafted for the use of the mills below the dam. The two companies soon became involved in difficulties over the charges imposed by the Susquehanna Company for the logs of the Loyalsock, as well as other matters of detail. This war continued until 1858, when an amicable agreement was reached and a petition was forwarded to the Legislature for permission to consolidate. This was granted, and a complete reorganization was effected.

In December, 1886, authority was obtained from the Legislature to construct a new and large dam, which was erected during the following

year. It is still in use. In after years, other boom companies were organized, notably at Lock Haven, at Jersey Shore and at Muncy, all of which were ultimately absorbed. In 1866 the Susquehanna Boom Company erected a large structure at Linden, connecting two islands and forming an almost continuous boom for a distance of six miles, with a capacity for holding 300,000,000 feet.

During the existence of the Susquehanna Boom Company it has had many distinguished lumbermen at its head, among whom were the following: John DuBois, 1849 to 1857; Mahlon Fisher, 1857 to 1859 and 1860 to 1874; Elias S. Lowe, 1859 to 1860; Peter Herdic, 1875 to 1878; John G. Reading, 1878 to 1883; Benjamin C. Bowman, 1883 to 1887. The officers in 1907 were as follows: J. Henry Cochran, president; Eugene R. Payne, treasurer; Edward P. Almy, secretary.

CHECKS TO PROGRESS.

In the spring of 1860 the first disheartening disaster occurred when a flood tore out a part of the boom, permitting the escape of more than 50,000,000 feet of logs. This was followed in the spring of 1861 by another break, with the loss almost as large as the first. In the same flood the Lock Haven boom broke, precipitating all its contents into the Susquehanna structure, which was the main cause of its giving way. These experiences, while costly, aroused the company to the need of greater strength of piers. Cribs of heavier construction were at once put in and the boom was ready for service the following spring.

The greatest disaster in the history of the boom company, as well as one of the greatest in the history of the lumber trade in general, occurred June 1, 1889, on which date the West Branch reached the unprecedented height of thirty-three feet one inch. This was over three feet higher than the boom piers, and the result was the loss of over 300,000,000 feet of logs. In addition, many millions of feet of sawed lumber were swept away, mills were wrecked and many manufacturers were ruined. The damage to the lumber interests of the valley was estimated at $4,000,000. Logs were carried to the Chesapeake Bay and out into the ocean. Millions of feet, however, were recovered, mills being erected at points along the river where they were afterwards sawed.

Five years later, in May, 1894, another flood, almost as disastrous, swept through the West Branch Valley, entailing a loss of several millions to the lumber interests. The plucky nature of the lumbermen asserted itself after both these floods, however, and, although many were irreparably ruined, those who could withstand the shock rebuilt their damaged plants and resumed business on a larger scale wherever possible.

OUTPUT OF THE BOOM.

The first accurate record of the operation of the Susquehanna Boom

Company was started in 1862. The figures show the great extent of the operations in the valley, the bulk of the manufacturing having been carried on at Williamsport. The following table gives the number of logs, with their board measure, for each year up to 1907:

LOGS PASSED THROUGH THE SUSQUEHANNA BOOM.

Year.	Number of logs.	Feet b. m.	Year.	Number of logs.	Feet b. m.
1862	196,953	37,853,621	1886	926,988	154,141,258
1863	405,175	76,475,826	1887	1,400,613	218,079,813
1864	511,549	96,595,681	1888	1,856,112	285,611,289
1865	379,392	72,421,468	1889	727,939	104,100,705
1866	615,373	118,831,494	1890	1,473,754	212,168,829
1867	833,388	163,196,511	1891	1,816,562	262,071,394
1868	853,663	165,338,389	1892	1,286,413	182,784,695
1869	1,080,511	223,060,305	1893	1,485,474	220,181,745
1870	1,099,777	225,180,973	1894	282,101	39,667,608
1871	842,129	166,661,181	1895	945,237	125,735,898
1872	1,484,103	297,185,652	1896	1,313,438	178,483,428
1873	1,582,460	318,342,712	1897	912,496	110,071,239
1874	989,586	180,734,382	1898	1,044,633	130,323,571
1875	1,096,897	210,746,956	1899	746,301	93,232,091
1876	715,087	134,396,293	1900	296,861	38,390,082
1877	598,827	106,944,257	1901	891,555	117,240,894
1878	617,552	112,069,602	1902	444,422	55,359,651
1879	1,040,278	190,549,111	1903	645,576	81,521,280
1880	788,104	13.,078,017	1904	415,565	54,956,740
1881	1,629,904	289,826,780	1905	414,630	56,004,994
1882	1,368,507	220,136,306	1906	248,927	32,237,438
1883	1,874,655	303,769,838			
1884	1,449,768	240,382,208	Total	42,980,186	7,061,489,760
1885	1,350,951	225,347,555			

During later years the above table does not represent, by any means, the entire supply of logs for the Williamsport mills, for as the supply tributary to the West Branch decreased, the manufacturers went back from the streams, by means of logging roads or the regular railroad lines of the State, and have brought the logs in by rail. The estimated stock for 1907 received by river was 40,000,000 feet. With the rail supply added, the total for the mills was approximately double that amount. The table, however, represents the great volume of lumber operations on the West Branch during the time accurate records were kept. Taking into consideration the product of the mills at Jersey Shore, Lock Haven and other up-river points, together with the operations of the Emery Lumber Company at Montoursville, whose logs came down the Loyalsock Creek, the grand total would probably considerably exceed 8,000,000,000 feet of lumber.

The number of lumber manufacturers at Williamsport is steadily decreasing. In 1902 the logs that passed through the boom were owned by the following manufacturers: Strong, Deemer & Co., Brown, Clark & Howe, Bowman-Foresman Company, W. Righter's Sons & Co., Ezra Canfield's Sons, Christman-Miller Lumber Company, Valentine Luppert, H. Loeb and J. W. Christman. The manufacturers operating mills in the city of Williamsport in the latter part of 1907 were as follows: The

Bowman-Foresman Company, Seth T. Foresman, President; J. W. Bowman, vice president; J. Roman Way, treasurer. Brown, Clark & Howe, composed of Stephen S. Brown's Estate, Timothy I. Clark and David A. Howe. The Central Pennsylvania Lumber Company, Charles S. Horton, president; Creon B. Farr, vice president; F. W. Simmons, second vice president; R. G. Brownell, secretary; Rosser Thomas, treasurer.

The average cost of rafting and turning logs over to the owners has been $1 a thousand feet.

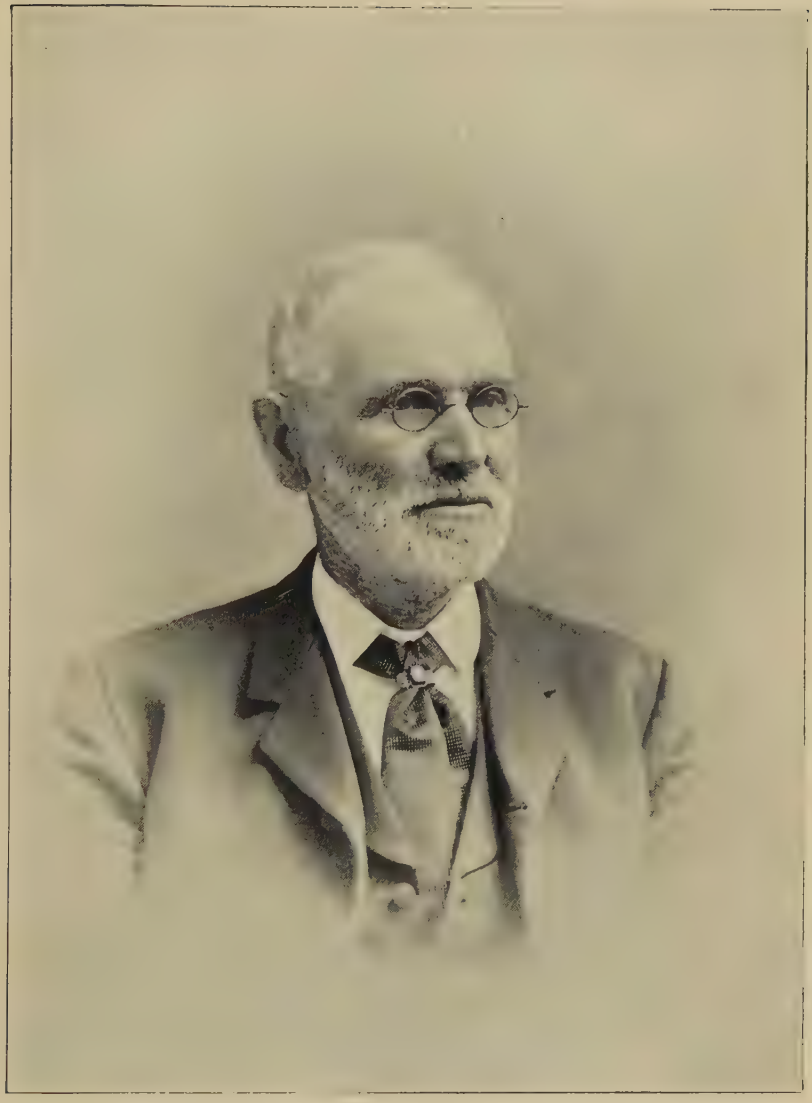
MAJOR PERKINS.

Major Perkins, whose untiring energy and skill did much to make the West Branch region a great lumber center, died at the age of ninety years, after witnessing the development of his brightest hopes. His influence permeated every portion of the West Branch Valley, and the people of Williamsport honored him in every possible way. He was elected mayor of the city, but always refused any other political office. He was born in South New Market, Rockingham County, New Hampshire, March 13, 1803, and came of Revolutionary stock. After his advent in Williamsport one of Major Perkins' first steps was to inaugurate a system of cash payments for labor, not in vogue in the locality at the time. This made him decidedly popular with the laboring classes, while his contemporaries looked on with amazement and predicted his early ruin. The soundness of his judgment was soon manifested, however, and success crowned the movement, and attended nearly all his efforts, as well. In addition to his lumbering and boom operations, Major Perkins had varied and large interests in Williamsport.

JOHN DU BOIS.

Another prominent man whose name has been mentioned in connection with the Susquehanna Boom Company was John DuBois. He was a lumber operator in his native State of New York until the disappearance of pine from his section caused him to remove to Pennsylvania. In partnership with his brothers, David and Matthias, he bought a mill site on Lycoming Creek, which joins the West Branch at Williamsport, together with a tract of pine land. This business was carried on successfully for several years. At this time he also purchased two farms, which are now in the heart of the residence district of Williamsport. He also bought 500 acres of land on the south side of the West Branch, opposite Williamsport, where, later, were located his large sawmills and lumber yards. This place was named DuBoistown in his honor. John DuBois and his brothers were heavy buyers of timber lands in Clearfield County, which lands supplied the logs for the Williamsport mill. Lands then inaccessible to lumber streams were also bought.

David DuBois died while the brothers were still operating on Lycoming



JOHN DU BOIS

WHO HAD A LARGE PART IN THE LUMBER HISTORY OF PENNSYLVANIA
BORN AT OWEGO, NEW YORK, MARCH 3, 1809. DIED AT DUBOIS, PENNSYLVANIA, MAY 5, 1886

Creek, and John and Matthias moved to Williamsport, where they erected a large steam gang sawmill on the south side of the river, giving employment to hundreds of men and sawing millions of feet of lumber annually. John survived his brother Matthias also, and became the sole owner of the vast DuBois interests.

John DuBois was at the very front of the movement which made Williamsport a great lumber center. Although to Major Perkins is given credit for the organization of the Susquehanna Boom Company, other prominent lumbermen were associated with him in this enterprise, foremost among whom was John DuBois. As has already been mentioned, he was one of the original stockholders in the company and was its first president, and to his energy and good management was due in large measure the subsequent success of this great enterprise.

By 1872 Mr. DuBois had exhausted his supply of timber tributary to Williamsport and moved his operations to what afterward became DuBois, in the northwestern part of Clearfield County, on the Allegheny watershed, an account of which is given in Chapter XXXVI of this work.

THE RIOTS OF 1872.

In the summer of 1872 occurred the only serious dispute between the lumber manufacturers and their employees. At that time the production of lumber was enormous and the stock was so large that the mills were nearly all run overtime, some of them operating twelve and fourteen hours a day. The employees formed an organization and made a demand for the uniform number of ten hours as a day's work. There were over 3,000 men employed. The demand for reduced time was refused. The manufacturers pointed to the fact that the year before the shipments were 269,963,392 feet, and the outlook was for an increased demand. The boom held nearly 300,000,000 feet, and the capacity of the mills was scarcely equal to the demand. On June 29 a strike was declared which continued for three weeks, closing all the mills. Concessions were offered by both sides, but the difference could not be amicably adjusted and the feeling became intense. Finally, several of the mills succeeded in resuming operations by desertions from the ranks of the strikers and the employment of new men. This added to the fury of the strike leaders, and they inaugurated a reign of lawlessness. The mills that had resumed were attacked and the workers driven off. Violence was resorted to and several men sustained serious injuries. Threats were made to burn the lumber yards, and the situation was such that an appeal was made to the Governor for military aid. Troops were hastily dispatched to Williamsport and restored order with little difficulty. The leaders of the strikers were arrested, tried, convicted and sentenced to the penitentiary. When the convicted men reached the prison, however, they were met by a messenger

from Governor Geary with a full pardon, and were at once released. Since that time there has never been any difficulty between the lumber manufacturers and their employees.

THE PRESENT INDUSTRY.

It was during the '70's and '80's that the manufacture of lumber in the West Branch region was at its height. The product was the finest quality of white pine, but in recent years this has given way to hemlock. At present there is very little standing pine and the hemlock forests are being rapidly depleted. Since the beginning of the industry over $10,000,000 has been invested in sawmills and employment has been furnished from 2,000 to 3,000 hands. The product has been estimated at nearly $7,000,000 annually.

An intelligent conception of the later lumber trade of this region may be obtained by a consideration of the rail shipments to market during 1902. From January 1 to December 1 there passed out of Williamsport on the various railroads a total of 9,055 cars of lumber of all kinds, representing 162,990,000 feet. Including shipments from points west as far as Renovo, Clinton County, and north on Lycoming Creek to Elmira, New York. The total shipments aggregated as follows:

From:	Cars.	Feet.
Williamsport	9,055	162,990,000
North	1,452	26,136,000
West	3,632	55,376,000
Total	14,139	244,502,000

On January 1, 1903, there were in first hands in the yards of Williamsport a total of 42,260,579 feet, of which 5,680,945 feet was white pine and 36,579,634 feet hemlock. In addition, the yards contained 14,544,100 lath and 1,260,970 pickets.

DECLINE OF RAFTING.

For many years a vast quantity of timber found its way to the eastern markets in the form of rafts floated down the West Branch during the spring freshets. There is no accurate record of the quantity in feet thus marketed but it is high in the millions. The rafts were usually made up of square timber and spars, although millions of feet of logs have also been shipped in this way. Lock Haven has always been the market for this form of lumbering, the rafts being made up at points along the river or on the tributaries and then speeded down the circuitous and tortuous stream to Lock Haven, where the broad expanse of the pool of the dam afforded a safe harbor. In years past purchasers from the eastern markets would congregate at this point by hundreds, and the timber would change hands as it lay on the surface. The new owners would then engage crews of from six to eight hands to conduct the rafts to the desired point down the river, Marietta being the principal rendezvous. Usually on the down-

ward passage the rafts would be buckled together in pairs, the chutes of the various dams along the river being sufficiently wide to permit their passage in this way. The rafts would sometimes meet with disaster on their voyage by being swept over dams or by colliding with bridge piers, in which event great trouble and expense would be incurred in recovering the timber and paying salvage to the "Algerines" who were always on the lookout for stray logs or timber.

The source of this supply of timber is now almost exhausted. While in years past the annual flow of rafts used to be numbered by the thousands, the output now is very small, the estimate for 1907 being placed at not over 150 rafts. The choicest timber was usually marketed by means of rafting, spars of great length and square pieces of enormous size going to the consumers in this way. The forests of the Clearfield region, the Sinnamahoning, Youngwomans Creek, Dents Run, the Driftwood and Pine Creek being the points from which the timber of choice pine would be harvested. That which was cut in later days came from near the headwaters of the river.

The lumber industry of the West Branch, while still active, has seen its best days, and a few years more will witness its close. The forests that remain are principally hemlock, the pine, with very little exception, having long since been cleared away. Fortunes have been hewn from "the woods," thousands of men have made lumbering their life work, but the experiences, the struggles and the triumphs are mostly of the past; and, as the stalwart figures in this great industry are gradually passing away, their achievements will soon be referred to only as history.

THE LUMBERMEN'S EXCHANGE.

In 1873 the lumbermen of the valley, realizing the need of organization, formed the West Branch Lumbermen's Exchange. It was incorporated by an act of Assembly, the original membership consisting of thirty-six manufacturers. The objects of the Association were to advance the commercial character and promote the general lumber interests of the valley; to inculcate just and equitable principles in trade; establish and maintain uniformity in the commercial usages of the region; acquire, preserve and disseminate valuable business information, and to avoid and adjust as far as practicable the controversies and misunderstanding that might arise in the trade. During the thirty-five years of the existence of this organization it has saved to the manufacturers more than $2,000,000 worth of logs and lumber carried away by floods. Through its "lost log" committee, stray timber has been pursued clear to the waters of the Chesapeake, recovered and sold and the proceeds turned over to the owners. Since the death, during the winter of 1903-4, of the veteran secretary of the Exchange, Mr. Prior, its existence has been formal rather

than active. It has maintained no office, but a committee of the remaining mills meets when there is any business requiring joint action. E. R. Payne is treasurer of the Exchange. During the period of greatest activity in lumbering on the West Branch the Exchange included in its membership all the manufacturers along the river, but in later years it has been confined to the principal firms at Williamsport.

OPERATIONS IN POTTER, CLINTON AND CLEARFIELD COUNTIES.

Such has been the history of lumbering at Williamsport, the center of the industry on the West Branch; but, perhaps, brief mention should be made of other territory in that region that had a share in contributing to the growth of Williamsport's lumber business.

Potter County, with the exception of its northwestern half which is drained by the Allegheny and its tributaries, at one time floated much timber and logs to Williamsport and Lock Haven. Lumbering has been this county's leading interest, as the lines of barren hillsides and great number of decaying sawmills mutely testify. Its history in this work is given in the chapter on northwestern Pennsylvania because its recent business has been carried on principally by rail in connection with that of the counties to the west.

Clinton County, in which the important lumbering city of Lock Haven is located, has manufactured immense quantities of lumber, lath, shingles and pickets, besides sending logs and square timber down the river. The business has employed thousands of men annually.

Another county that has borne an important part in lumbering operations is Clearfield. The present business amounts to little, but at one time it bore the same relation to the prosperity of the county as does the coal business of today. Lumbering was first engaged in, not for the money it would bring on the market, but simply to clear the land for settlement and agriculture and to supply the local demand for lumber.

Prior to 1805 Daniel Ogden and Frederick Haney each built sawmills, and soon afterward Daniel Turner put one up on Clearfield Creek. In 1808 sawmills were erected by Robert Maxwell near Curwensville and by William Kersey at the Kersey settlement. Soon after this James and Samuel Ardery built a mill near the old Clearfield bridge. All of these mills were built to supply the local demands of settlers.

Among the first to manufacture lumber for market down the river was one Shepherd, who operated on the Sinnamahoning, in the then northern part of the county but afterwards in Cameron County, about 1822. Shepherd manufactured some lumber, but rafted mainly square or hewed timber. Between 1825 and 1830 an extensive operator on the Sinnamahoning was "Buck" Claflin; after him, and prior to 1830, the Colemans were large operators in that locality. Farther up, on Bennets

Branch, in what is now Elk County but then in Clearfield, the Johnsons, the three Winslow brothers and one Shaffer operated. These mostly operated on Sinnamahoning Creek, and only when the lumber became scarce did the business extend farther up the smaller streams. At first timber was so plentiful that no one dreamed of operating on a stream that was not large enough to navigate a raft.

The lands were nearly all taken from the village of Karthaus to the Cherry Tree about the year 1832. The object in those days was to get the rafts to market as soon as possible, and only a small quantity of lumber was manufactured or sawed. Log-floating was not indulged in until about 1857 or 1858.

From 1830 to 1840 the following were among those who went to Clearfield County and operated extensively in lumbering, many becoming permanent residents of the county: John and William Irvin, John Patchin, Judge Richard Shaw, Alexander, Matthew and David Irvin, Graham & Wright, Fitch & Boynton, Ellis and William Irwin, Bigler & Powell (Mr. Bigler becoming Governor of the State in 1851), A. B. Waller, Stewart & Owens, James Forest and John M. Chase.

The lumber cut during those years was marketed principally at Harrisburg, Lancaster and Marietta (Maryland), to which points came buyers from New York, Philadelphia, Washington, Baltimore and other large cities to purchase.

Lumbering was the chief occupation of nearly every resident land owner in the county for the next twenty years. Among the many who went to Clearfield County in the '40's was John DuBois, whose extensive interests have been more particularly mentioned on a previous page. His first operations in this section were on Sinnamahoning Creek, then in Clearfield County, making his headquarters at Williamsport. He afterward became the leading lumberman of the county.

Among other prominent lumbermen and firms who went to this region in the '40's were John G. Reading & Co., of Williamsport, and Perks & Bowman, who operated on the Moshannon. The Dodge tract, on the Sinnamahoning, was also opened in the '40's.

A new system was introduced on the West Branch in 1857. Instead of rafting, as theretofore, operators began floating logs to Williamsport, where the river had been boomed to receive them. As this practice deprived the rafters of their livelihood, they organized to prevent it. An armed party of rafters drove off the floaters from Clearfield Creek, and the practice was abandoned there, although it continued elsewhere.

The lumbering business reached the height of its prosperity about this time, and any attempt to give a list of those engaged in its prosecution would be useless.

In connection with lumbering on the West Branch and its tributaries it may be mentioned that all lumbermen had equal rights in the pursuit of their business on streams large enough for rafting and floating, as the river and its branches were declared by the Legislature to be public highways for that purpose. This act was a necessary one, as thereby conflicting claims were prevented.

An interesting feature of the lumber business in this region[2] in the early part of the Nineteenth Century was the making of the "long-lap" shingles. These were made by hand, one man turning out from twenty-five to forty in a day. They were hauled across the mountain road, to Birmingham, in Huntingdon County, where they were sold at $4 and $5 a thousand in store goods. Later, "big joint" shingles were manufactured.

INSPECTION AT WILLIAMSPORT.

The West Branch Lumbermen's Exchange, on December 28, 1875, adopted rules of inspection for pine and hemlock that were made applicable to lumber handling in the Williamsport and Lock Haven markets, and throughout the district of the West Branch of the Susquehanna River. These rules were reaffirmed from time to time and remained in vogue down to recent years without material change. As the shipments from that section were largely to Philadelphia and Baltimore, a knowledge of the inspection customs of the producing point conveys as well an idea of the inspection at the consuming or distributing points. As in all other markets allowance must be made for variation in practice, while the rules are observed as a standard. The rules are as follows:

RULES OF INSPECTION.

Adopted by the West Branch Lumbermen's Exchange, and in vogue at Williamsport and other contiguous points.

Selects and Better.—Shall include all the better grades of lumber that are equal in value to the following described piece: Not less than 8 inches in width and perfect up to 10 inches in width, except sap, which may be admitted one and one-half times the thickness on the back side.

Above 10 inches wide will admit of imperfections equal to three small knots, and sap one and one-half times the thickness on face side; above 14 inches wide will admit of imperfections equal to sap as above, and larger knots and straight split one-sixth the length of the piece; as the width increases, will admit of greater imperfections, but not enough to decrease the value below the first described piece.

Picks.—This grade shall include all boards below the grade of selects and better that shall be equal in value to a piece from 6 to 9 inches wide, that shall have a perfect face, with back side sound and free from badly stained sap.

Above 9 inches wide will admit of defects equal to sap 2 inches on either edge of face side, and knots equal to one knot 2½ inches in diameter.

[2]Credit is acknowledged to "History of Clearfield County, Pennsylvania," edited by Lewis Cass Aldrich, 1887, for the greater part of the information regarding Clearfield County contained in this chapter.

Above 13 inches wide may admit of defects equal to sap 3 inches in width on either edge of face side, and three knots 2½ inches in diameter. All boards of this grade above 10 inches, may admit of straight split, one-sixth the length of the piece, but no board shall be of less value than the first described piece.

Flooring.—Shall include all boards below picks that shall be 5 inches in width, with red sound knots not exceeding 1½ inches in diameter. Will admit of sap one and one-half times the thickness of the piece, and when above 10 inches in width may admit of straight split one-sixth the length of the piece, and should be free from shakes, rot and loose knots.

Third Common or Barn Boards.—Shall include all lumber below the grade of flooring that is of fairly sound character. May admit of straight split one-quarter the length of the piece, and should be free from large loose knots, bad shakes and rot.

Culls and Samples.—Shall consist of all lumber of a generally unsound character, and where the imperfections are too great to allow of the board being used for the ordinary uses of third common or barn boards. Worthless, rotten lumber should not be counted in this grade.

Pickets.—No. 1 shall be clear of knots, wane and black sap; not less than ⅞ of an inch thick and 2½ inches wide. No. 2 may include sound knots, stained sap and wane not to exceed one-half the thickness of picket.

Square pickets to be of same grades.

Lath.—No. 1 shall be 1½ inches wide, not less than ⅜ of an inch thick, packed in bundles of 100 pieces to each bundle.

Hemlock.—Shall consist of two grades, merchantable and cull hemlock.

Shingles.—Are graded No. 1 and No. 2, and are 24 inches in length. No. 1 should be clear of sap and knots; ⅝ inch at the butt and ⅛ inch at the point. No. 2 should be clear at least one-third inch the length from the butt, but the balance will admit of small knots, if sound, and some sap.

CHAPTER XXXVI.

NORTHWESTERN PENNSYLVANIA.

The counties of Northumberland and Allegheny were created by act of the Assembly March 27, 1772, and September 24, 1788, respectively, and comprised all of the northwestern part of Pennsylvania. The Six Nations of Indians, at a council held at Fort Stanwix, Oneida County, New York, October 23, 1784, conveyed this territory to the State of Pennsylvania for $10,000. By a confirmatory treaty with the Wyandots and Delawares at Fort McIntosh, in Pennsylvania, in January, 1785, formal possession was given to the white people of the vast section from which has been created the counties of Tioga, Potter, McKean, Warren, Cameron, Elk, Forest, Jefferson, Clarion, Butler, Lawrence, Mercer, Venango, Crawford, Erie and portions of Bradford, Lycoming, Clinton, Clearfield, Indiana, Armstrong, Allegheny and Beaver, being known as the "Later Purchase," by the Commonwealth and not by William Penn or his heirs.

Most of this territory is drained by the Allegheny River and its tributaries and contains the extensive forests that have furnished the lumber supply of that vast region of the State. Large grants of land were made to William Bingham, Robert Morris and others and smaller ones to officers and soldiers of the Revolutionary army, and settlements were promoted in the accessible places on the larger streams in many sections of the district. The men who constituted this army of pioneers in its conquest of the forests had the qualities that insure success.

The lands of William Bingham were subdivided and in 1797 nearly 300,000 acres were sold to the Ceres Company, of which the managing trustee was John Keating, who had for agents and assistants many whose names have survived in the nomenclature of the towns and streams of the section. They were engaged for eighty-seven years in selling this purchase, and the timber therefrom has supplied some of the largest lumbering operations of the State.

Francis King located a settlement at Ceres near the State line, where the Oswayo flows into New York on its way to the Allegheny River, in the northeast corner of what is now McKean County. The new town was named for the promoting company, which in turn was named for the goddess of grains, agriculture being the chief aim of the company in developing the country. Settlements were soon made at other points of the county

where waterways furnished means of floating their products and the timber of the region to the markets. Rafts of timber were made during the winter and floated down the river to Pittsburg, but lumbering was of slight consequence for many years. The agents of the various land companies were busy, and development continued for a half century.

When that romantic enthusiast, Ole Bull, with his 105 followers founded the illstarred Norwegian colony in the summer of 1852 on the waters of Kettle Creek, a tributary of the West Branch of the Susquehanna, in the southeastern part of Potter County, and devoted so much of his time and energy to building his castle among the pines and hemlocks on the banks of Bull Run, an almost unbroken forest stretched away to the westward for a distance of more than 150 miles. It was chiefly mature hemlock timber and included several counties, embracing upward of 5,000,000 acres; but there were strips of white pine fringing the streams, and ridges of hardwood timber which had succeeded the original growth of evergreens, wherever forest fires or tornadoes had destroyed it or where it had succumbed to insect blight.

Before the Genesee Valley Canal was completed to the Allegheny River at Mill Grove, New York, connecting that stream with the highways of commerce toward the eastern markets, the only outlets for the lumber and timber products of this vast region were the Susquehanna and Allegheny rivers with their tributaries, down which much timber and lumber was rafted to the markets along the rivers. Many emigrants to Ohio went on the rafts with their effects, and the lumber was used to build their homes and for other improvements in the new region that was being populated so rapidly.

But the inroads upon the forest by these limited means were insignificant and confined to the immediate vicinity of the largest streams. The completion of the canal and, soon after, the building of the Philadelphia & Erie Railroad through so much of the forest, and the building of the Allegheny Valley Railroad from this timber to the western sections of the State, soon developed the lumber industry, and most of the white pine was cut and marketed previous to that new era of our commercial life which began in the early '70's.

The forests seemed interminable and the riot of devastation continued unabated for twenty years. Lumber and bark were cheap in the markets, yet the better part of the timber paid well, while the commoner timber paid little, and the poorer trees—those crooked and affected by blight and the partial decay of age—produced only loss. The profits were partly or wholly absorbed by loss from the inferior grades; much timber was, therefore, left to the fires.

Another cause of great waste was the practice by which the hemlock

trees were often cut down and peeled by men who had no interest in any product but the bark. And in their anxiety to get it all at the cheapest rate the trees were felled upon stumps, logs and knolls, or anything that offered the possibility of keeping much of the trunk above the soil. The trees were broken by this method and a very great waste of timber resulted. It is hardly necessary to add that all the timber and trees that were left were soon consumed by the forest fires that raged almost annually in the hemlock slashings and frequently in the adjacent forests.

Soon after 1850 many persons bought timber along the Allegheny River, among whom were B. S. Caldwell, Walter Ray and Henry Martin. These men established lumber camps for getting out pine timber and the streams were filled with logs each winter to stock the markets farther down. Lumbering was done then with teams of oxen in the woods and the logs hauled to the streams by horses. The amount of pine taken out was comparatively small for a long time. The call for volunteers in the Civil War took away many of the men for three or four years and the sales of timber lands progressed so slowly that timber was little thought of and the lumbermen were not careful about cutting over the boundary lines when the timber tempted them by its excellence or by its convenience to streams or roads. It was customary for buyers to select such lands as best suited them, and many queer shapes were measured off to fill the requirements. Frequently long narrow strips of land only a few rods wide and a mile or so in length were plotted. Some of the owners, as time passed, seemed to forget the original points of their boundaries and their domains turned, as it were, on a pivot to embrace the desirable timber within its radius. Much saw timber was left by the lumbermen upon the ground lumbered over and was collected by prospectors who spent the long winters shaving shingles, which were taken to market on the spring rafts of pine timber.

After the war closed the men returned to the woods and the increasing prosperity of the succeeding seven years stimulated great activity in lumber operations. Mills were enlarged and improved and the era of building tram roads into the denser parts of the forest and along the valleys where the timber was easily gotten from the hillsides, dawned. These roads were usually made of material at hand. The foundations were of logs upon which were laid cross-ties of planking; for rails there were "spiked ribbons" sawed from hard maple timber over which the cars of logs were hauled by horses or mules. These were fairly satisfactory until the necessity for rails of iron or steel developed.

So for twenty years the elements and the flight of time, augmented by the wastefulness of man, narrowed the forests until the denuded hills seemed to rise like grim specters to rebuke him for his wantonness.

Timber lands that had been stripped of pine were frequently sold for taxes for small sums and considerable tracts were, in this manner, acquired by those whose foresight prompted such investment, before hemlock timber came into general use and the markets fixed its value. Both these and the larger estates of the early investors had long sought for buyers at very low prices—frequently only $2 or $3 an acre; but they rose rapidly in value and commanded from $8 to $15 an acre in 1880, continuing to increase in value and demand until at twenty years after the beginning of the hemlock era, in 1873, many large tracts were sold at the fabulous price of $40 to $80 an acre, and more in certain cases.

Although hemlock bark was much in use at the local tan yards of this section, which operated for the local trade only, and had been used for many years at the larger ones east of the Allegheny Mountains, it was contended that upon the western slopes it was poor in tannic acid—that the percentage was far below that from the eastern slopes—and, consequently, there was small demand for any bark from this vast hemlock forest. Tanners were very stubborn and slow to yield their prejudices, but from 1870 they began to see the error of the contention, and during the next twenty years the industry removed from the eastern section to the more favored and better supplied western slope. Along the Allegheny waters in southern New York and northwestern Pennsylvania were built tanneries of vast proportions and much larger capacity than ever before, until now their product supplies most of the sole leather in the world.

The completion of the Buffalo, New York & Philadelphia Railroad, connecting the Pennsylvania & Erie Railroad with the Great Lakes and crossing all the trunk lines of the railroads between Buffalo, New York, and Emporium, Pennsylvania, greatly stimulated business along its lines; tanneries and sawmills were speedily put into operation and the forests were attacked by large armies of men getting bark and timber ready for the markets. The hum of the industry broke over the once solitary region and the slow-going mulay sawmill was superseded by modern sawmills with rotary saws and machinery to meet the changed conditions. The transitory water power was augmented or supplanted by the more reliable and stable steam engine.

Large areas of the hemlock forests were bought by the United Sole Leather Tanners and all of the leading tanners of the section entered the pool whereby the yield per acre of both bark and timber has been very much increased and the economy of using the bark has afforded far greater results, for one-half of the land is furnishing as much leather as the whole formerly supplied.

Under the conservative management of the present owners, during

the last ten years or more, the hemlock forest lands have yielded sufficient bark to supply the demand for leather at about the former level of prices and there seems to be plenty of bark and a visible source of supply for twenty years more. In 1890 the best informed thought that ten or a dozen years more would practically end the bark supply of Pennsylvania.

SUPPLY OF STANDING HEMLOCK.

A local authority, in 1904, estimated that there remained in the State about 3,000,000,000 feet of hemlock. These figures were far below the truth, for nearly that quantity has been cut since he made his estimate. In 1906 alone there was 966,480,000 feet cut. The earliest important estimate of standing hemlock in the State was by Sargent in the early '80's; he assigned the stumpage of hemlock at 4,500,000,000 feet. In 1896 Professor Fernow published an estimate made by the Commissioner of Forestry of the State giving the hemlock stumpage at 5,000,000,000 feet. The census of 1900 gave the quantity of hemlock owned by lumbermen at 3,904,200,000 feet. All of these figures fell far short of the mark, and, while there is no way of stating how much hemlock is actually standing in the State, the quantity may be safely estimated at 10,000,000,000 feet in 1907.

The owners of most of the hemlock lands of the State have begun to improve the methods of operating the lumber end of the proposition. They have purchased extensive plants for manufacturing lumber and the other products of their lands and have them in operation under the direction of experienced and skillful men who have had practical training in that business.

Hemlock lumber has, at last, attained its proper place beside spruce and shortleaf pine and commands prices that are fully equal, for ordinary framing and building material, for which it is preferred, to those of any other kind of cheap lumber in the great markets of the country, where its use has become general and its stiffness and strength, together with lightness and durability, are well known and appreciated.

During the first ten years of the hemlock era new railroads were constructed through portions of the forest area. In the early '80's the opening up for traffic of the Buffalo & Pittsburg Railroad through portions of McKean, Elk, Clearfield and Jefferson counties; of the Buffalo & Allegheny Valley Division of the Pennsylvania Railroad, which follows the Allegheny River from Olean, New York, to Oil City, Pennsylvania, through portions of Cattaraugus County, New York, and McKean, Warren and Forest counties, Pennsylvania, besides many branches of these, and extensions of the New York, Lake Erie & Western Railroad and various independent lines, supplemented by the lumber roads and short lines that were soon projected, created an ever widening field of operations and an increase of hemlock product.

At first sales were made only in the local markets and those points adjacent to New York that were reached by direct lines of railroad; but the New England states and New Jersey, Delaware and Maryland were soon made the patrons of hemlock in very large quantities by the improved transportation facilities. The oil regions were always a good market, and when the development of oil territory began in Ohio, Indiana and West Virginia, the spread of the westward market for hemlock was greatly stimulated. In 1888 shipments from Pennsylvania to Ohio began freely, and rapidly expanded to immense volume. The demand of West Virginia and Indiana required large shipments during 1890 and thereafter for several years. The close of 1892 witnessed an unusual and temporary development of trade in Illinois so that the market at that time may be said to have been throughout all the states north of Virginia from the Mississippi to the Atlantic, except Maine, Wisconsin and Michigan. The annual product of hemlock lumber from the forests of the State approximated 2,000,000,000 feet.

During the financial depression beginning in 1893 and covering a period of four years, the supply was much curtailed and has not been as large since. Now it is said to be close to 1,000,000,000 feet annually—less than half of the previous volume—but the output of Wisconsin, Michigan and West Virginia has greatly increased. So the hemlock supply has been sufficient for all demands where the price of lumber has made it desirable to furnish it, although the supply of other lumber coming from the South and West at reasonable cost makes less demand than was the case when good hemlock boards were only $12 or $13 in the markets—several dollars a thousand feet under the cost of suitable substitutes of pine or spruce.

There is still, however, within the United States, a good supply of hemlock for both tanning and lumber and as it is now supplemented for tanning by the use of chestnut timber which is ground in powerful machines, similar to the "hog" used for reducing slabs and refuse, and the acid then extracted, the waste product of many places is made available in the market and a source of much profit to the owners. As the demand for bark will be less and that left most economically used, the hemlock bark of Pennsylvania, Michigan and Wisconsin will last a long time.

THE PENNSYLVANIA LUMBER STORAGE COMPANY.

In 1884 four of the largest operators of the western slope established a mutual selling agency, under the above title, that disposed of all their combined product of lumber. These were F. H. Goodyear, S. S. Bullis, J. J. Newman and G. D. Briggs, who for two or three years did much to resist the downward tendency of prices that was so stubborn between the years 1884 and 1888. The prices established by them were adopted

by many others, but with the improved conditions of 1889 they disbanded the organization and each made selling arrangements as best suited him. Under this organization Mr. Bullis established large storage yards at Olean, New York, and Bradford, Pennsylvania, where nearly 100,000,000 feet each year was assembled from many mills for planing and seasoning, and then reshipped, after being graded, to the market. This was the best arrangement ever established for catering to the markets of the New England states and for other long shipments, for the grades were uniform and the lumber dry when it went forward; but it was more expensive to handle the lumber through these yards than at the mills, as the other operators did, and it was abandoned after three or four years' trial.

In the early days of hemlock lumbering all the hollow and defective butts and many broken pieces of trunks were left upon the ground, besides many defective trees that were of little value for lumber but which contained portions of sound timber. These were available for the shingle makers at slight cost and there sprang up a large business in some of the sections for saving these otherwise waste products. The cheapness of hemlock shingles made them desirable for all convenient markets throughout Pennsylvania, Ohio, New York, New Jersey and parts of New England.

In the best mills the use of the bandsaw has been prominent for ten years or more; but most of the small mills are still equipped with rotary or circular saws as they were twenty years ago. Every year witnesses the exit of prominent sawmills from their former precincts. Many of the operators have removed to the timbered sections of other states, where more numerous and extensive forests supply logs for lumber and timber cheaper than in Pennsylvania. As most of the lumber railroads have been abandoned, the cost of construction is lost to the present and all future generations of men; but there are some that have become links in permanent railroad systems which will enhance the value of contiguous property for all time. Some of the lands have been cleared for farms and continue to furnish tonnage for the roads to haul to market, but much is barren waste of brush wood, bramble and fern.

Such is the development of the industry of western Pennsylvania forests—an industry that has furnished the material for producing leather and for constructing comfortable homes throughout the central and eastern states at less cost than any other; which has made an empire of a once trackless forest and has furnished the necessary funds to improve the counties that have been created, to erect substantial public buildings, good roads and safe bridges; fostered a profitable and convenient home market for the products of agriculture, and furnished an inducement for constructing permanent and valuable railroads that will be a benefit to the entire State for all future time.

The great timber sections of Potter, McKean, Elk, Clearfield, Jefferson, Clarion, Forest and Warren counties have been operated continuously for a period of eighty years and still produce considerable quantities of lumber. The original growth was of a very high quality of white pine and hemlock.

In 1821 John J. Ridgway, of Philadelphia, a Quaker, secured a grant of 100,000 acres in Elk and McKean counties and soon afterward attempted to found the town of Montmorency, six miles north of the present city of Ridgway, in Elk County. The grant was secured and colonizing commenced strictly as an agricultural proposition, the timber being regarded only as an encumbrance to the ground. However, the agricultural possibilities of the land were limited; the crops were scanty and in some cases failures. Montmorency and the farming community established thereabout were not successful.

It was no later than 1825 that a sash saw, grist and carding mill was built on Big Mill Creek, a tributary of the Clarion River. This mill was erected to supply the local demand for grinding corn, carding wool and making lumber.

It was in 1827–8 that logging operations were instituted at Ridgway and the first settlement at this point inaugurated. It was the inception in this locality of the rafting of logs to Pittsburg and the other older settlements to the south and west. The logs were hewn, bound into rafts and floated down the Clarion and Allegheny rivers to the then young and growing city of Pittsburg, and thence down the Ohio River as far as Louisville. It is alleged that the first Ridgway raft of cork pine was sold at Pittsburg at $5 a thousand, and half of the sum realized was taken in window glass, at that.

Lumbering operations in that section, which began, approximately, in 1825, have continued to the present day. The original operations consisted exclusively in the production of hewn square timber, known latterly as board timber and sold by the cubic foot. The round logs were flattened on four sides so that a log rule with a five-inch hook would cover the round of the log. These "round-square" timbers were made up in rafts of from 3,500 to 5,000 cubic feet. The rafts were constructed from twenty to twenty-four feet in width and 130 to 150 feet in length. There are records that log rafts of this sort sold at from five to six cents a cubic foot in 1862. Immediately after the war prices rose as high as twenty-eight cents a cubic foot, and within a few years rafts have been sold as high as twenty-nine cents a cubic foot.

Ridgway was soon recognized as the most desirable location in the vicinity for a town site, but it was not until 1836 that the first sawmill was erected there. The enterprising builders were Dickinson, Wilmarth

& Gillis, and, of course, it was of the sash-saw variety, of small capacity and uncertain working. This was the beginning of the present sawmill industry of Ridgway, which has resulted in many lumber fortunes and the making of much lumber history in western Pennsylvania.

As the rafting of square timber continued to increase down the Allegheny from its several branches, so also did sawmills multiply in Ridgway and the lumber sections thereabout.

The Portland mill was built by Breen & Co., of Louisville, in 1856. In this operation Colonel Wilcox afterward became a partner. By reason of his masterful genius, J. S. Hyde soon became the greatest lumber producer of the Ridgway district. He built mills at Eagle Valley, Ridgway and Elk Creek and later the "rough and ready" circular mill at Ridgway. He also built several mills on the Little Toby. George Dickinson erected the first circular mill at Ridgway in 1857.

This original growth of white pine timber showed a stand of from 20,000 to 40,000 feet to the acre and occasional acres have been found to produce as high as 100,000 feet. With the advent of railroad transportation sawmill operations on a considerable scale have been carried on at the manufacturing points named above and a large quantity of the product has been shipped by rail. However, even up to the present time, an occasional raft is forwarded to down-river points on the spring freshets.

During the spring tides of the '80's W. L. Sykes was engaged upon a tract of land in Elk County, at Benzinger, which yielded a fine lot of various hardwood timbers, as well as hemlock; and he was very careful to get the most out of all that his land contained. Machinery for making dimension for the furniture trade was purchased and more was invented by him, so that everything of value might be saved from the burning bank and prepared for use at the lowest possible cost. In fact, he saved the cost of all his land and more from the profits upon the product that most operators overlooked and left to feed the fires that swept over the slashings.

When this tract was finished and there was no more stock to buy at Benzinger he organized the Emporium Lumber Company to operate chiefly in the hardwood timber of the vicinity. He has since done a large and profitable business and the extensive mills at Keating Summit, Austin and Galeton, in Potter County, manifest the result of his genius and experience.

In McKean, Potter, Elk and Cameron counties are the great hemlock and hardwood operations of the Goodyear Lumber Company, with headquarters at Buffalo. Frank Henry Goodyear's purchases in this section of northwestern Pennsylvania constituted the key of the situation from a lumber operating standpoint. This timber was not overlooked by the

pioneer Pennsylvania operators by any means, but it was regarded as being so inaccessible that the cost of providing facilities for getting it into the market was prohibitive to a possible profit.

It was about twenty-three years ago that Mr. Goodyear went down into the Austin-Galeton regions of Potter County and bought miles upon miles of hemlock and hardwood timber lands along the Pine, Kettle and Sinnamahoning creeks. He bought right and left tracts that lay miles away from large streams, which were then regarded as the only means of transporting logs to mill, and bought tracts that had been passed upon and rejected time and again by experienced Pennsylvania operators. At his price Mr. Goodyear bought everything in sight; then he built sawmills at the very thresholds of the forests. He built the best mills that could be constructed and after they were built he arranged facilities for stocking them and for electrically lighting them. The result was that when a mill was once set to running it ran day and night from midnight Sunday to midnight of the next Saturday almost without cessation. Hemlock bark, which has been disposed of largely to the United States Leather Company, has been an important factor in money-making for the concern. Its hardwood holdings, which are interspersed with the hemlock, it has chosen to dispose of to hardwood people. The company has done the loading and transporting of logs to mill but otherwise has kept out of the hardwood lumber business entirely, satisfied with carrying the hemlock end.

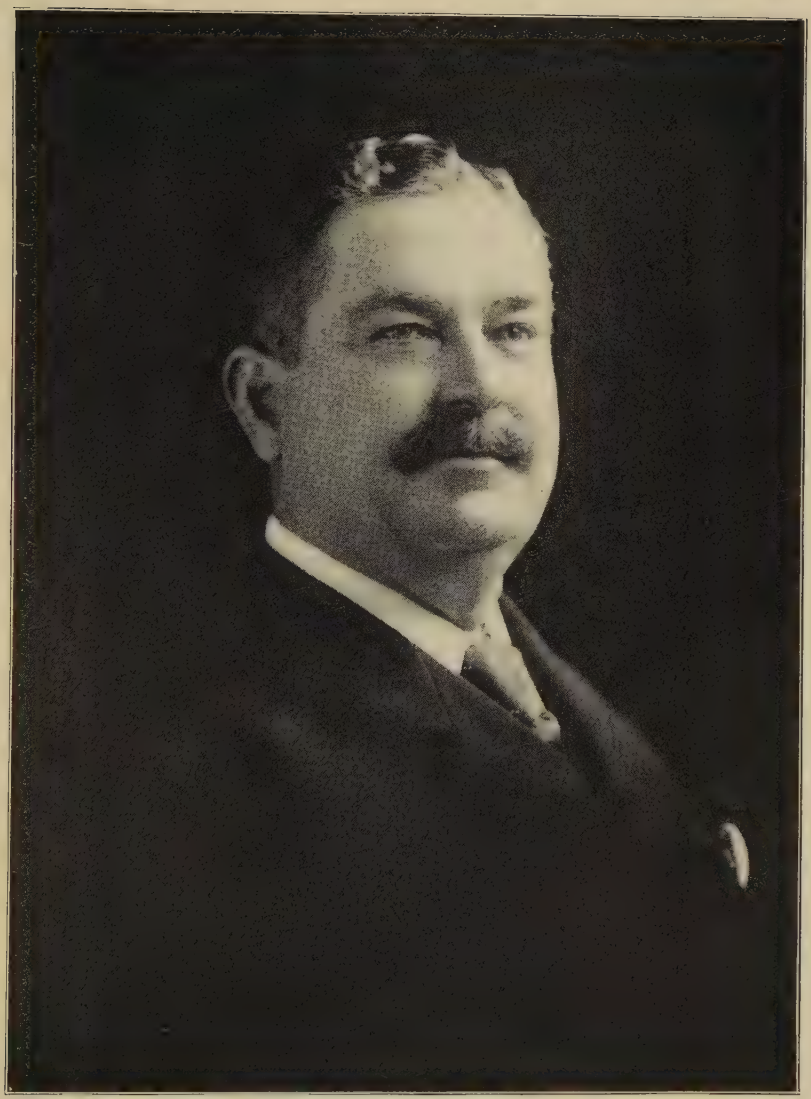
Another feature which has contributed to the success of the Goodyear operations was the invention and development of the steam log loader, of which Mr. Goodyear was the pioneer so far as a machine of practical value goes. At the time that the Barnhart steam log loader was put into practical operation the Goodyears were cutting about 100,000,000 feet of lumber a year, and, by reason of rough topography, the logging expense was very heavy. Mr. Goodyear became impressed with the fact that it should be possible to build a modification of the steam shovel that could be carried on a train and be shifted from car to car and could be effective in economically picking the logs out of the holes and gullies and off mountain sides along his railroad. He took into consultation the Marion Steam Shovel Company, of Marion, Ohio, which resulted in the building of the Barnhart steam log loader. The machine has been a success from its inception and very little modification has ever been made in it, save to strengthen the parts by substituting steel where formerly iron was employed. More than a dozen of the loaders are now utilized in the Goodyear operations, and hundreds have been sold to other operators. The total Goodyear lumber handlings in Pennsylvania embrace an annual output of upward of 200,000,000 feet of hemlock and well toward as much more of hardwoods.

Frank H. Goodyear died May 13, 1907, at his home in Buffalo, of Bright's disease, after a few days' illness. He was fifty-eight years of age.

The beginning of the last decade of the Nineteenth Century was marked by increased activity throughout the hemlock belt, and the price of this lumber increased. Besides the operations of the Goodyears mentioned above, other combinations of capital were in the field and operated upon a large scale. The Lackawanna Lumber Company, the Allegany Lumber Company, the Cartwright Lumber Company, Bemis & Son, the Smethport Extract & Lumber Company, Arnold, Dolley & Rowley, the Olean Lumber Company, Wetmore & Son and the Penn Lumber Company were representative of Potter, McKean, Elk and Warren counties, and all had improved facilities for handling logs and lumber, both in the forest and in the mills and yards. Most of them built logging railroads through their timber and pursued logging during the entire year. In other localities other combinations of men pursued the same general line of operations, and the cost for logging and manufacturing into lumber the peeled hemlock timber seldom exceeded $5 a thousand feet. Freight charges to New York City and equivalent distances from the mills averaged about $5 a thousand feet on green lumber, and for special bills the market price was about $13 a thousand feet; so it will be seen that above the average mill cost of the lumber and railroad transportation there remained about $3 a thousand feet, which left only a narrow margin after the cost of selling the lumber and the original cost of the timber were deducted. To be sure, the profit upon the dry lumber was more, but most of the lumber was cut into dimension for special bills that were shipped green.

The finest specimens of McKean County's magnificent growth of cherry were cut prior to the '60's. In that decade, however, there was much merchantable stock left, and a narrative by one of the early operators, E. N. Mead, of Buffalo, giving some idea of the operations then obtaining, is here interpolated and will be found of much interest. Mr. Mead says:

> Back in '65–'8 I would say that from what I know and heard while there, this county probably furnished more good cherry lumber for its area than any other section of Pennsylvania. Tradition, verified by many stumps of great size in the woods, says that the finest trees (many at least) had been cut in the '40's, the lumber sawed on the old mulay or gate saws, and rafted down the Allegheny River, as no railroads were within reach at that time. The operation I was connected with was a small one, only about 300 acres, but it was considered the best cherry grove in the county. We turned out a little over 3,000,000 feet, or an average of 10,000 feet an acre.
>
> There was not much sale at that time for any but clear stock ten inches and up wide, and "clear" meant "clear" in every sense of the word. A few gum spots would make a "common" of the otherwise finest board. We cut nothing under twelve inches at top and not so small as twelve inches unless very smooth and straight. Ten inches and up, clear, we sold at $35 per thousand at mill; common at $20; culls at $10. But the common then would be half firsts and seconds today, and the culls, half common. I have



FRANK HENRY GOODYEAR

FOR THIRTY YEARS THE LEADER IN THE HEMLOCK INDUSTRY OF PENNSYLVANIA
BORN CROTON, N. Y., MARCH 17, 1849; DIED BUFFALO, N. Y., MAY 13, 1907

loaded many cars of clear, five-eighths of an inch to seven inches thick, ten to twenty-four inches wide, largely eighteen inches and up, twelve feet to sixteen feet long, largely sixteen feet, for $38 on cars, hauling costing $3. Practically all of it went to the Albany market—by rail to Buffalo and by canal from Buffalo to Albany. It would, I suppose, be practically impossible to find any stock today which would approach this in quality. Old Oliver Bugbee, who handled the most of our stock, has often told me it was pronounced the finest ever sent to the Albany market. We cut it all on a circular saw. With a modern band we could have produced lots of thirty-six inch stock. I sigh for the cherry that is gone.

I will relate one little circumstance that occurred. Two of my log cutters sawed down most of their trees. In this case they cut entirely through the tree, driving wedges behind the saw, and the tree stood on the stump about twenty-four hours, until a breeze toppled it over. It was over three feet in diameter at the butt, made four sixteen-foot logs and stood straight as a gun barrel.

Forest County was one of the prolific lumber sections of the State. Tionesta Creek is one of the most important streams that empties into the Allegheny River, the principal lumber rafting stream in the State beyond the Susquehanna district. The Tionesta is a swift stream that cuts its way through the hills—which might more properly be called mountains—throughout its entire course. Numerous small streams enter it from both sides, among which are Blue Jay Creek, the Upper Sheriff River, Low Sheriff River, Fools Creek, Logan Run, Phelps Run, Bobbs Creek, Salmon Creek, Lamentation Creek, Bear Creek, Ross Run, Jug Handle Creek, Little Coon Creek, Coon Creek and Johns Run. Prior to 1880 the large sawmills and lumber manufacturing establishments were located on the main creek and not on the branches of the stream, and the old mills that were located on the main water are in many cases abandoned; but several of these mills, in consequence of the growing lumber trade, were rebuilt, and improved machinery placed therein.

December 23, 1882, the *Northwestern Lumberman*, a predecessor of the *American Lumberman*, published an article showing the extent of lumber operations at that time on the Tionesta and its tributaries. The article is reproduced here:

A large mill has been erected, near Balltown, by F. Henry & Co. The other mills of note are at Buck Mills, about twenty miles up the creek. Below it three miles, on the south bank of the creek, is the mouth of Salmon Creek. At this point a large hemlock bark extract company is located, the works being operated by W. W. Kellett & Co., of Boston, Massachusetts. The establishment, which was erected at a cost of $130,000, does an extensive business, manufacturing hemlock extract for tanning purposes for exportation. Above it, on Salmon Creek, about one mile up, is the mill of the Salmon Creek Lumber Company, which cuts 4,000,000 or 5,000,000 feet each year, mostly hemlock, for which, as well as cherry, ash, beech and other timber, it is noted. This company has 80,000 acres heavily timbered. Near the mouth of Salmon Creek there is a fine bed of most excellent fire-brick clay, which appears to be very deep, and it is said a company is preparing to work it. Newton Mills, about a mile and one-half below the mouth of Salmon, on the creek bank, manufactures a large amount of

lumber, the product being mostly pine. The proprietors, Wheeler, Dusenbury & Co., are owners of extensive tracts of timber lands. They have vast tracts of hemlock and other woods of valuable character. These mills have been there for nearly forty years, and such is the growth of timber that some of the territory near the creek has been cut over three or four times, and still great quantities remain, the hemlock being scarcely touched, while pine is exceedingly abundant. This firm has between 110,000 and 120,000 acres. Years will pass before the different establishments can finally exhaust the timber on these immense tracts, even with the accession of modern improvements in mill and machinery. Certainly there will be no exhaustion in this generation.

The next mills immediately on the creek are at Nebraska, at the mouth of Cook Creek, six miles above the mouth of Tionesta Creek, where there is also an iron bridge, flouring mill, store, and quite a settlement. But by far the most important enterprise here is the mill of T. D. Collins. The establishment is well supplied with all the latest improvements, machines and contrivances. A planing mill is attached. The proprietor has also been building of late years commodious and stanch barges for the coal trade on the Ohio and Mississippi rivers. This is a new and important industry which is steadily increasing in extent and profit. It might be mentioned that, at Oldtown and other points on the Tionesta, large flat boats and barges are built each year suitable for heavy transportation. Besides this industry, many operators are busily engaged in getting out square timber for the lower markets, which is mostly run to Pittsburg and sold there, the timber being suitable for heavy buildings, railroad bridges, etc. This is an industrial interest in which numerous firms and individuals along the creek and its branches are engaged.

Among the other mills are those of Gibson & Groves, at the mouth of Low Sheriff River; of Dr. Towler, on Salmon Creek, who does a heavy business in cherry and ash; the Hunt and the Red Brush mills of Root & Watson, which annually cut a large quantity of pine and other lumber and send it down the Tionesta; the Shipe, on the upper waters of Salmon Creek; the Russell, a large and important one; the new mill of Lawrence & Dale, on Lamentation Creek, and farther down, the mill of John Sheasly on Little Coon Creek. The establishment of Ford & Lacey, on Coon Creek, turns out a large quantity of lumber annually, while the other mills are actively employed through the entire year manufacturing all classes of lumber, which finds a ready and profitable sale in the eastern and other markets.

From the above statements may be imagined readily the importance of Tionesta Creek as a highway for the people, as well as its value to the lumber trade, and, in short, its importance to the commercial world. That its free navigation is impeded by obstructions, both natural and artificial, has long been a source of regret to the lumbermen and others interested in the lumber industry and its associate interests. That the stream can only be used during the spring and fall, and sometimes during June, for the running of heavy boats and rafts, is also a matter of much regret, and, as all lumbermen know, there is no good reason why it should not be improved by slack-water dams, and other constructions, at no great expense, so it could be used all the time, or a greater portion of the time, at least. It is proposed to interest the United States Government in the scheme for improving the water course. . . .

The eastern portion of Forest County is the section containing the vast forests of pine, hemlock, chestnut, beech, ash, maple, oak and other timber, being essentially different in the character, size and superiority of its timber from the western part. Tionesta and its tributaries are lined with this timber far back into the highlands, the evergreen timber standing clear through to the Sinnamahoning, a distance of nearly 100 miles, and a writer well observed that, "Eastern Forest, and parts of Clarion, Warren,

Elk and McKean counties contain a body of hemlock timber of gigantic growth, the very largest of the kind in the world, there being nothing to compare to it in Russia, British America, or the islands of the seas."

This is literally and actually true. There is no such continuous body as this on the face of the earth. If any one disputes this statement, let him state where any similar immense and valuable forest territory exists. The finest of this gigantic body of hemlock timber lies in the Tionesta Creek Valley, and through this channel must find its way to market.

Forest County contains exactly 430 square miles. It is safe to say that one-half of it is covered heavily with this timber. This area reduced shows a grand total of 275,840 acres. Of this acreage one-half, or nearly 138,000 acres, is thus heavily timbered and the lumber from the same can be run down Tionesta Creek.

It is safe, judging from an excellent knowledge of the timber, to say there are over 900,000,000 feet of hemlock alone that could go down the creek, to say nothing of the bark. This is a very low estimate, considering the character of the timber, Of pine, say 300,000,000 feet; of oak, say 200,000,000, and other wood, including cherry, birch, beech, ash, maple, chestnut, etc., 400,000,000 feet. This is a moderate calculation of the timber resources of the Tionesta Valley. The amount of lumber run from the various mills, with all the disadvantages of impeded navigation, reaches probably 40,000,000 feet a year. This would be doubled were the streams improved.

WARREN COUNTY.

So important was the lumber industry to Warren County in early times and so great was the lumber supply it contributed to the markets that some special mention of it, though brief, seems appropriate. The city of Warren is practically at the head of navigation of the Allegheny River. Olean, New York, ordinarily has this distinction, but in the days when the rivers were depended upon for transportation, Warren could be reached the year round by boats coming up the Allegheny from Pittsburg and other points, when Olean was cut off by low water.

The Allegheny has a course of about forty-five miles through Warren County, and during the first half of the last century was the scene of an enormous traffic in logs and lumber by raft and barge. The products of the mills higher up the river were added to by those in Warren County itself and by those which were able to float their products down the important streams emptying into the Allegheny within the county. The most important of these streams were the Conewango, the Brokenstraw, the Kinzua and the Tionesta. The Conewango, rising in New York, and down which flowed the waters of Casadaga Creek and of Chautauqua Lake, was the ancient northwestern boundary of Allegheny County when that political division occupied all of the extreme northwestern portion of Pennsylvania. Brokenstraw Creek was one of the earliest lumber streams in the entire section. There seems to have been a distinct influx of settlement about the beginning of the Nineteenth Century which utilized these two streams as a source of logging supply. Tionesta Creek was also one of the famous lumber streams of the country in those days; and

Kinzua Creek, while smaller than the others, until near the end of the last century furnished a large timber supply. Other streams which furnished water power for the oldtime sawmills or were sufficiently large to float rafts, are Willow Creek, Sugar Run, Cornplanter Run (the home of the famous Cornplanter, the Indian friend of the whites in the last half of the Eighteenth Century), Hemlock Run and Tidioute and West Hickory creeks.

Joseph Gray was supposed to have built a sawmill on the Brokenstraw, where now is the village of Garland, as early as 1800. Jeremiah, Samuel and James Morrison settled in Mead Township before 1800 and soon erected a sawmill. In Farmington Township a sawmill built by William Sheldon is said to have been running before 1803.

Between 1795 and 1805 the county was definitely settled, although there were portions of it that for fifty years longer remained wilderness. As usual, the sawmill accompanied settlement, and, in fact, until the growing population turned its attention more definitely to agriculture, lumbering was the chief business of the people.

In the borough of Warren, the county seat, a mill was built by one Daniel Jackson, a pioneer, about 1800, and the sawing of the first board was the occasion for a grand celebration. The first product of this mill was delivered by raft to Pittsburg. It contained 30,000 feet of white pine, and was the first from Warren County to descend the Allegheny. About the same time, Joseph and Darius Mead built a mill on the Brokenstraw, and within the first ten years of the last century mills had been erected on all the leading streams. Up the Conewango, at what is now Russell, in Pinegrove Township, there was a mill as early as 1801, and in 1803 two more mills were built in that vicinity.

Most of those who in recent years have written about the forest resources of Pennsylvania have given Warren County slight attention, assuming that it was never of much importance as a pine producing district; but the early chroniclers dilated upon the pines of Warren County, inferring that they were at least equal in quantity to the hemlocks, while much superior in value, although the northern part was essentially a hardwood region. Schenck's "History of Warren County," published in 1887, says regarding Deerfield Township, "Pine and hemlock in enormous quantities covered nearly every valley and ridge." Speaking of a sawmill in Sheffield Township, the historian said: "It was then closely surrounded by a forest of lofty pines. One of these trees at the height of eight feet from the ground measured twenty-three feet in circumference; another made seventeen sawlogs sixteen feet long." The truth of the last statement may well be questioned, but it reproduces a significant tradition. The surface of this township was said to have been almost entirely covered as late as 1848 by a dense growth of pine, mingled with considerable

hemlock. Deerfield Township, on the Brokenstraw, had pine as its chief timber asset. Even as late as 1897 a tract of about 4,000 acres of white pine, located near Warren, was cut. It was of virgin growth, soft and clear and had been for years the finest piece remaining in the State.

Perhaps the most interesting part of the early lumber history of Warren County has to do with the rafting and boating of lumber down the Allegheny. As stated above, Brokenstraw Creek led in this work, its first raft going to Pittsburg, but within a few years this trade had extended, until by 1805 the shipment was sent down to New Orleans. Several trips were thus made during 1805 and succeeding years, and good profits were realized, although at great hazards. The best quality of pine brought in New Orleans what was then the enormous sum of $40 a thousand feet. The men who took these flat boats almost to the mouth of the Mississippi, guiding them more than 2,000 miles through the wilderness, were of hardy body and daring mind. Most of them walked all the way back from New Orleans, though some of them managed to obtain transportation around to Atlantic ports by coasting vessels, whence they walked home. Judge Johnson, of Warren County, in an address said:

> The first foreign traffic in pine lumber on the Brokenstraw of which I have any certain account was a fleet of three boats gotten together at the mouth of the creek in the fall and winter of 1805–6, and started on its perilous voyage to New Orleans on the first day of April, 1806. The lumber had been gathered from the mills of Long and Ruse, Mead and others, of the best quality, stub-shotted and kiln-dried during the winter while the boats were building, and was owned by Colonel William McGaw and William B. Foster, and brought in New Orleans $40 per thousand feet. Daniel Horn and Daniel McQuay were two of those on board and they walked back. In the spring of 1807 another fleet of seven boats freighted with seasoned lumber owned by Joseph Mead, Abraham Davis and John Watt started for the same destination—New Orleans. The owners returned by sailing vessels to Philadelphia, the pilots and hands finding their way back as best they could. McQuay and others are said to have made several return trips on foot.

As the lumber business developed, the rafting business increased with it, until it reached its greatest magnitude in the third decade of the century. Some of these rafts were of enormous dimensions. One owned by Captain Warren, when it passed Cincinnati, Ohio, contained 1,500,000 feet of boards. It covered an area of nearly two acres, and, it was asserted, was the largest raft ever seen on the Ohio River.

Warren County did not furnish by any means all the lumber that went down the Allegheny, but it supplied an important part of it and was the scene of concentration for the smaller rafts that came down the tributary streams and from the upper waters of the Allegheny.

The lumber business is not entirely extinguished in Warren County, but it has been of declining importance for forty or fifty years. The pine was largely cut away during the first half of the Nineteenth Century, and

then after a time hemlock came to the front. Now this, too, is largely gone.

Two towns in the county—Warren and Tidioute—have occupied a special place in the annals of the lumber business, partly because they were and are the place of residence of men famous in the lumber business, and whose operations, as Warren County timber disappeared, extended into other counties and into distant states, while the county as a whole has had a farreaching influence upon the development of the lumber business of the country.

CLARION COUNTY.

One of the most famous lumbering streams of Pennsylvania is the Clarion River, from which the county was named. This was essentially a white pine stream, and until 1890 considerable quantities of pine were put into it for manufacture at the mills along its course. It drains portions of Forest, Elk and Jefferson counties as well as Clarion. The southern boundary of the county is the famous Red Bank Creek.

According to the "History of Clarion County," by A. J. Davis, published in 1887, Clarion was then the third lumber county in the State, being second only to Lycoming and Clearfield in the production of pine, and exceeded only by Allegheny and Northumberland in oak.

Located on the Allegheny, which forms part of its western boundary, and the Clarion it was largely cleared at an early date, although lumber manufacture did not begin there as soon as it did in the counties located on the upper Allegheny. It contains 462,240 acres and as long ago as 1872 it was estimated that there were only 93,394 acres of unimproved woodland remaining. In 1885 there were only fifteen sawmills, and in 1907 there were eleven which the commercial agencies reported as using a capital of $15,000 or more. There have always, however, been some good sized mills in the county. The chief center of lumber manufacture has been the town of Clarion, the county seat.

Sawmill construction began about 1805. In that year James Laughlin and Frederick Miles built a mill at the mouth of Piney Creek. In 1815 Henry Myers erected a mill in Beaver Township. About 1820 one of the first lumber women on record, a Mrs. Black, built a sawmill in Elk Township. In 1818 Alexander McNaughton put up a sawmill on Little Toby Creek. An important milling district was Mill Creek Township, through which Mill Creek runs. One of the earliest Mills in the county was built in 1812 at Reidsburg, on Piney Creek. In Richland Township the first mill was built by Henry and John Neely about 1820, on Alum Rock Run.

The early mills were all run by water power, the first circular steam mill built in Clarion County being that of the Jamestown Company at the mouth of Mill Creek, which was erected in 1853.

One Thomas Peters, in 1822, under a special act of the State Legis-

lature, erected a dam for lumbering purposes across the Clarion at the mouth of Turkey Run. This act was interesting inasmuch as it provided for the maintenance of the Clarion River as a navigable stream. While the grant of the right was in perpetuity it was specially provided as follows:

> Said Thomas R. Peters, his heirs and assigns shall, at all times, keep, support and maintain a race or canal at least sixteen feet wide, with a lock or locks, if necessary, the gates of which shall not be less than eighty feet apart, which lock or locks shall be effectually supplied with water for boat and canoe navigation. . . . And provided further that the said Thomas R. Peters, his heirs and assigns shall construct and maintain a slope of at least forty feet wide and two feet below the summit level of the dam, over a convenient part of the said dam, for the passage of rafts descending the said river, and that the slope shall have an apron or incline four or six feet for every foot of said dam above the ordinary level of the water.

The northern half of the county was heavily timbered with pine and hemlock and furnished the basis for most of the lumbering operations. The timber was more scanty in the southern half of the county and what there was was chiefly used by the furnaces.

Clarion County, as will be seen from the above, long ago ceased to be a lumber producer of importance, although the Clarion River until a comparatively recent date was one of the great lumbering streams of Pennsylvania, depending, however, upon the territory on its headwaters for supplies after those of Clarion County had been largely exhausted.

CLEARFIELD COUNTY.

In the chapter relating to the West Branch of the Susquehanna River, Clearfield County is especially mentioned because most of its area is drained by tributaries of the West Branch and, therefore, during the time when it was of most importance from a lumber standpoint, it sent its forest products down those waters to the East. The northwestern part of the county is, however, within the Allegheny watershed, and there, at DuBois, has for many years been located one of the great lumbering towns of Pennsylvania, supporting a business which is among the most notable of all the lumbering enterprises of the United States. This is the business established by that famous lumberman, John DuBois.

He was born at Owego, Tioga County, New York, in 1809. He engaged in the lumber business in his native State, but, with the disappearance of pine from that section, he moved his operations to Pennsylvania. His first interests were in the Williamsport section, and are mentioned more particularly in Chapter XXXV of this work, devoted to that district. By 1872 he had exhausted his supply of timber available to Williamsport and again moved his operations, this time to Sandy Creek, on the western slope of the Alleghenies, where he erected a small circular mill. This was the beginning of the great mills and lumber interests at DuBois, Clearfield County.

The first small mill was followed by larger ventures. Dams were built, land cleared, roads made and houses erected until the scope of his lumber transactions and the completion of the low grade division of the Allegheny Valley Railroad drew a large population to DuBois. John DuBois' industries afforded employment to a large army of workmen. When he began his operations DuBois contained but three houses, and within a little over a decade the population had increased to 7,000. Mr. DuBois built three sawmills, a box factory, cleared a 1,200-acre farm and erected 100 dwelling houses. He died in 1886, leaving his property, valued at about $8,000,000, to his nephew, John E. DuBois.

It is doubtful if, at the time of his death, there had been any man between Maine and Michigan who had owned more timber land and had cut more timber than he, and two years before his death he owned 33,000 acres of land in one connected body near the town of DuBois, on which there was standing 350,000,000 feet of white pine besides many million feet of hemlock.

THE EXTREME NORTHWEST.

The counties in the extreme northwestern part of the State—Erie, Crawford, Mercer and Venango—have no recent lumber history of importance, although the first settlers found the country covered with forests of great density, consisting mainly of pine, hemlock, chestnut, walnut, cherry, beech and maple, and some fine tracts of moderate size remained to a recent time.

It is estimated that about two-thirds of the land in Erie County has been cleared and that very little timber of merchantable value is left. The French Valley pine and hemlock were rafted to Pittsburg principally, while the merchantable timber which grew near the lake was shipped to the Buffalo, Cleveland and New York markets. Today, Erie is an importer rather than an exporter of lumber.

History has it that Capt. Russell Bissell, of the United States army, superintended the erection of the first sawmill built in Erie County. This was in 1796 and the mill was put up to supply timber for barracks, dwellings, etc., for the soldiers, who had been detailed to protect the lives and property of the settlers. It gave name to the stream on which it was built —Mill Creek—and stood until 1820, when it was destroyed by fire. George W. Reed and William Himrod erected another sawmill on the same site in 1831, the frame of which stood for many, many years, a notable landmark.

The first cargo of pine lumber ever imported into the city of Erie from Canada was bought by Finn & Stearns in 1860. Other early lumber dealers were George Selden, the Bauschard Manufacturing Company, William Truesdale, Henry Jaques, William Walker and Herman Janes.

The lumber dealers in this city, in those days, secured most of their product from the country people in the vicinity and shipped large quantities by lake and canal to Hudson River points.

Crawford County's timber species were varied and numerous. Chestnut and hickory were the principal growths on the dry gravelly lands; the beeches, maples, white ash, poplar, walnut and ironwood were found on the rich, loamy soil, and on the wet lands bordering the streams were found the hemlock, black ash, sycamore, soft maple and birch. Extensive groves of white pine skirted many of the streams. As has been said, however, these counties today are given over mostly to agriculture and mining.

CHAPTER XXXVII.

SOUTHWESTERN PENNSYLVANIA.

On the 5th of November, 1768, there was added to the domains of the Colony of Pennsylvania more than 10,000,000 acres of land which was mostly a heavy forest. By reference to the map of Indian purchases, in Chapter XXX, page 528, of this work, it will be seen that the southwestern part of this tract included the territory now embraced within the counties of Washington, Greene, Fayette, Somerset, Westmoreland and Cambria, and the greater part of Indiana, Armstrong, Allegheny and Beaver. These ten counties, together with Bedford, Fulton, Blair and Huntingdon counties, whose territory was embraced in a purchase made in 1758, comprise the section treated of in this chapter.

Southwestern Pennsylvania was long claimed by both Virginia and Pennsylvania. The title of the former, resting on an indefinite Crown grant, was claimed to cover practically the whole of the western part of the present State, though, in fact, jurisdiction never seems to have been exercised far north of the Ohio River. It was not, however, until after the Revolution that Mason and Dixon's line was finally completed and extended to the charter limits of Pennsylvania, from whence the western boundary was surveyed north to Lake Erie. The southwestern portion of the State was, therefore, included in Virginia counties, being divided at a late colonial period among three of them, called Ohio, Monongalia and Youghiogheny. Under the Pennsylvania claims to the territory, however, that portion of the State was embraced under one county—Westmoreland. At first it was Chester County—one of Penn's original counties, extending indefinitely westward along the southern part of the Province to the unlocated western boundary—then successively, by subdivision, Lancaster, Cumberland, Bedford and Westmoreland. From the last-named were formed all the other western counties of the State.

LUMBERING OPERATIONS.

That portion of southwestern Pennsylvania situated near the Kiskiminitas, Allegheny, Ohio and Monongahela rivers and the lower section of the Youghiogheny was lumbered off in the early part of the Nineteenth Century; but the interior and mountainous parts retained most of the timber until the Twentieth Century, owing to their inaccessibility and the rapid current of the streams which made rafting impracticable. In some sections the construction of railroads during the latter half of the last

century made the timber along the lines available for lumbering; but a very large portion was left for the logging railroads of this century to develop.

This section originally contained a great variety of timber, including white pine, walnut, cherry, ash, hickory, oak, birch, maple and hemlock; but hemlock did not predominate as it did in the more northern counties. After the white pine was cut off the balance did not attract large lumbering enterprises, and most of the remainder of the timber has been cut off as the factories demanded it for local consumption. The later lumber history of the section has, therefore, been of little interest, and involves but few operations of importance.

In the beginning of the last century boatbuilding for the river commerce was active and consumed much white pine lumber for that purpose in addition to the building demand for the homes and the trades. Then followed wagon and carriage shops, and factories for manufacturing the agricultural implements of the period, which used the best hickory, ash and oak timber of the whole region. Then the demand for staves for barrels and nail kegs used much oak, and the furniture trade grew rapidly, using the beautiful walnut, cherry and many kinds of less valuable woods. For twenty-five years the river was the commercial highway for all freight. Conestoga wagons carried goods and travelers to the interior points where no navigable stream existed. Then came the era of canal building and the great Pennsylvania Canal was completed and opened from Pittsburg to Philadelphia in 1834, connecting the Ohio River with the seaboard. Manufacture was stimulated and the mining of coal, which had been chiefly along the banks of the Monongahela, was extended, and iron mills increased.

When the middle of the century was reached railroad building began. The Pennsylvania Railroad was completed, connecting Pittsburg with Philadelphia and the East, in 1852. Then the growth was rapid, and the lumber trade increased by leaps and bounds.

In 1864 the Union Star Freight line was organized through the efforts of William Thaw, of Pittsburg, and others. It was the means of simplifying and cheapening the cost of freight transportation. Previous to that all the railroads acted independently and usually had their depots widely separated, so that freight had to be transferred from one railroad to another by teams, which was both slow and expensive. The improved facilities that followed greatly stimulated manufacturing, and the demand for lumber began to be supplied by car as well as by boat and raft.

The great number of coal mines that were opened at this time made an immense trade in mine supplies from the forest, and pit rails and ties, made from oak and other hardwoods of firm nature, were in such demand

that all grades of wood were used for them. Props and timbers for the mines called for all sizes of timber, and the trade took posts of three inches and larger at the top. Small mills flourished and supplied lumber from the small tracts of timber in the vicinity of the mines; but, when the supply became scant toward the end of the last century, many lumber railroads were constructed and larger mills located thereon to furnish the lumber needed.

Such, in general, has been the lumber history of the southwestern section of Pennsylvania. A more detailed account of lumbering in the separate counties, or such of them as have a lumber history of sufficient importance to merit chronicling, or regarding which records are available, will now be given.

FAYETTE AND SOMERSET COUNTIES.

The first white settlement west of the Allegheny Mountains was made in 1752 by Christopher Gist, in what is now Fayette County, west of the Youghiogheny River. In 1765–6 settlements were made at "Redstone," now Brownsville, and at Turkey Foot. About this time a number of settlers migrated to this section from Virginia.

In Somerset County, at Ashtola, the Babcock Lumber Company in 1897 began operations, and constructed forty miles of railroad to make its timber available. It has two sawmills with a monthly capacity of 5,000,000 feet of lumber. These mills cut hemlock, maple, beech, birch, oak and cherry. This company has about 300,000,000 feet of standing timber in Somerset County tributary to its plant and mills, and has one of the most complete lumbering plants of the State.

Soon after 1900 the J. R. Droney Lumber Company, of Olean, New York, built about fifteen miles of railroad north from Confluence, on Casselman River, and constructed a band mill. It has about 100,000,000 feet of timber, and saws about 1,000,000 feet a month.

At Elk Lick is located the firm of Jennings Bros., with a band mill, several miles of railroad and a large body of timber.

HUNTINGDON COUNTY.

At Birmingham, a borough in Huntingdon County, the abundant and superior water power was utilized as early as 1786 by the erection of a sawmill on the Little Juniata River.[1] Lumber, shingles and hoop-poles were among the staple articles of trade of Birmingham at the period of its greatest prosperity, between 1835 and 1846. Many "arks" loaded with these commodities left the "public landing" and "Laurel Spring wharf."

The following interesting bit of lumber history regarding Onedia Township, Huntingdon County, is taken from Lytle's history, quoted above:

[1] "History of Huntingdon County," by Milton Scott Lytle, 1876.

During the construction of the Pennsylvania Canal a great quantity of timber was furnished for it from this township. The waters of Standing Stone Creek afforded the means of transportation for all kinds of water craft, from a sawlog raft to a canal boat, and within the last forty years it was no unusual sight to witness twenty or twenty-five arks and rafts, in a spring freshet, gliding down that turbulent stream. . . . William Foster, an old resident, did a large business for that day in the manufacture of lumber, and built and owned what is now known [in 1876] as Foster's sawmill. . . . At his sawmill was built the first packet-boat ever navigated on the Pennsylvania Canal, the "*Lady of the Lake*" by name, which, on a balmy Sabbath morning in the summer of 1831, left her dock and sped gracefully into the waters of Standing Stone Creek, and was by them carried swiftly toward the Juniata, amid the plaudits of wondering spectators who crowded the banks. Subsequently, a boat yard was established there and kept in operation several years.

According to I. D. Rupp's history, Huntingdon County in 1840 had thirteen lumber yards, employing 213 hands, and 182 sawmills. The sawmills, together with four flouring mills and sixty-five grist mills, employed 262 hands, had an aggregate capital of $149,047, and the value of their manufactures was $103,897.

CAMBRIA COUNTY.

Egle's "History of Pennsylvania," published in 1883, has the following to say regarding the lumber business of Cambria County:

Lumber has been an important article of commerce. In the neighborhood of Johnstown, at Ebensburg, at Wilmore and at other points vast quantities of hard and soft lumber, such as ash, maple, cherry, poplar, cucumber, etc., have been manufactured for the eastern and western markets, and immense quantities of hemlock are shipped for building purposes. The shook business is carried on extensively in various parts of the county, more particularly at Ebensburg, Conemaugh, Summerhill, and Chest Springs. This is the manufacture of oak timber into vessels to be shipped to Cuba and other points for molasses, rum, etc. In the northeastern, northern, and northwestern portions of the county the lumbering business is a heavy element of prosperity. The pine lumber trade in this region has been principally conducted by rafting the timber, sometimes manufactured into boards, but oftener the squared logs, formed into rafts, down the Susquehanna to the eastern markets. More recently, however, what is called logging has been more generally adopted. This consists in cutting the pine logs into proper lengths, and floating them down the stream, *au naturelle*, to the market. Timber thus floated pays tribute at the boom at Williamsport, and thence proceeds on its way east. On the most trifling streams this traffic is carried on by means of "splashes"—that is, a dam is constructed over the stream, and the water is pent up until it becomes a large body; the timber is put into the stream below; at the proper time the sluices or gates are opened, and the timber floated down to the river. There is no township in the county in which the lumber business is not pursued with more or less success; and the growing scarcity of the article only enhances the value of what remains.

At Allendale, Cambria County, A. P. Perley, of Williamsport, has a gang mill and several miles of railroad.

INDIANA AND WESTMORELAND COUNTIES.

There is considerable timber standing in the northern part of Indiana County upon the highlands where the railroads have not as yet touched.

At Glen Campbell H. E. and J. O. Clark and the partnership H. E. & J. O. Clark have sawmills and are manufacturers and wholesalers of lumber.

Westmoreland is a big county and pretty well filled up with coke ovens and coal mines. There are many small sawmills scattered all over the county and the aggregate output of mine supplies is large; but the larger mills are becoming scarce. At Ligonier the Byers-Allen Lumber Company has a band mill and several miles of railroad into the timber, which is composed of various hardwoods. This company gets a choice quality of chestnut from the hills in that locality, where forest fires have never been serious.

BEAVER COUNTY.

The first settler in Beaver County was Levi Dungan, who emigrated to that county from Philadelphia in 1772;[2] but the date of the settlement of this county, together with that of its near neighbors, Armstrong and Butler, also Greene in the extreme southwestern corner of the State, is usually given as from 1796 to 1800. By 1795 Pennsylvania's claims in the western region had been definitely settled and the frontier had been subdued; consequently, immigration to this section was rapid during the closing years of the Eighteenth Century.

In 1800 a sawmill was erected in Fallston, Beaver County, by David Townsend.[2] The site upon which Brighton and Beaver Falls were in part first laid out had the first improvement made upon it in the summer of 1801 by David Hoopes & Co., and the erection of grist mill, sawmill and forge was begun, and they were put into successful operation in 1802.[3]

ALLEGHENY COUNTY.

Sawmills and grist mills were the first manufacturing establishments in Allegheny County. The pioneer mills of the county were at Pittsburg and in its vicinity, and, as they are given detailed mention in Chapter XXXVIII of this work, need not be specifically mentioned here. In the old townships on the south side of the rivers—Moon, St. Clair and Mifflin—also in the townships of Elizabeth, Versailles and Plum, mills were established on all of the principal runs before 1794, and, as soon as the north side was secured from Indian raids, in the new townships north of the rivers.[4] In Forward Township Samuel Walker (who emigrated from Wilmington, Delaware, in 1785) and John Craighead owned an early sawmill in partnership.[5] The date of its erection is not given. Another old sawmill was located at Noblestown, adjoining Colonel Henry Noble's "merchant-mill," one of the earliest in the county.[5] This sawmill was probably erected about the year 1796, or earlier. Felix Negley built a sawmill in

[2]"History of Beaver County," A. Warner & Co., 1888.
[3]Egle's "History of Pennsylvania," 1883.
[4]"Allegheny County," by J. W. F. White, 1888.
[5]"History of Allegheny County," A. Warner & Co., 1889.

East Deer Township in 1797. Early in the Nineteenth Century there were two sawmills in Baldwin Township, on Sawmill Run, one at Castle Shannon and one at Fairhaven. In 1840 Allegheny County had thirty-one lumber yards, having a capital of $240,000.[6]

WASHINGTON AND GREENE COUNTIES.

The Wabash Railroad has opened up some timber in the western part of Washington County, and small mills are busy getting out oak timber and railroad ties. Greene County has not been a desirable place from which to ship lumber, as the railroad to Waynesburg is narrow gauge and the freight rates and transfer charges are prohibitive to the cheaper class of lumber; consequently, the timber may remain until the coal beds are opened and a home market thus assured for the lumber.

THE ROMANCE OF AN OLD MILL.

The following story, while it may lack historical value, is so tinged with sentiment that it seems deserving of a place in this volume.

Before railroads destroyed the usefulness of stage coaches in Pennsylvania, the village of Truman's Corners was an important coaching station on the old State road and several converging local turnpikes. In 1840 Cyrus Miller, Lewis Dorr and John A. Merritt settled there. Miller bought the tavern located at the place, tore it down and erected a larger one. Lewis Dorr, being a carpenter, did the work. Miller also put up a sawmill near by and employed Merritt as his sawyer. Miller kept the tavern until 1882, when he deeded his property to his son, but continued to live in the tavern. His mill, though in its later years having very little to do, he kept running every day from the time he turned on the water in 1840, and it was probably the only old-fashioned upright sawmill left in that part of the State. John A. Merritt was the only sawyer who ever manipulated its machinery, and he had grown gray listening to its clatter. Lewis Dorr, who built the old tavern and the mill, boarded at Miller's tavern, occupying the same room for over forty years.

On January 28, 1884, Miller's son sold the old tavern stand and the mill property against the wishes of his father, who was seventy-five years old and whose one great desire was to die in the house he had founded. The new proprietor was to have possession March 1. Old Mr. Miller's health had been feeble for some time, and he took the matter so much to heart that he died on the following Thursday night, January 31. The following morning his life-long friend and companion, Lewis Dorr, was found lying on the edge of Truman's Brook, under the turnpike bridge, dead. It was supposed that he was crossing the bridge on the planks that served as a footway while the bridge was being repaired, and losing his balance, fell into the creek below.

[6] "Early History of Western Pennsylvania," 1846.

About ten o'clock the next night the cry of fire was raised in the village for the first time. The old sawmill was in flames, and, as there was no means at hand with which to fight the fire, it was soon destroyed with its contents. Early Sunday morning John A. Merritt, the sawyer, called on George Hendershot, who had purchased the mill property a few days before. He told Hendershot that the mill had cost Mr. Miller for ten years from $100 to $200 a year more to run it than he received for its work, and that there was no possible chance for it to do any better. There were $125 worth of logs and $200 worth of other material burned up with the mill. The mill and machinery were worth $300.

"Now," said Mr. Merritt, "you paid Billy Miller $700 for the mill, and it wasn't insured. I have come to give you that much money."

Hendershot expressed his surprise at this offer and asked an explanation.

"I helped build that old mill," said Merritt, "and haven't missed a day's sawing in it from the first time I turned the water on the wheels, nearly forty-five years ago, and no other man ever sawed a log in it. Billy Miller sold the property, and his father's dead from it, and Uncle Lew Dorr, I believe, drowned himself because his old friend died. All three of us came to this place together and I knew that if I had to step out of that mill and see another man running it I wouldn't live a week. So I set it on fire and burned it up, and now I want to pay you for it."

CHAPTER XXXVIII.

PENNSYLVANIA—THE PITTSBURG DISTRICT.

All that part of Allegheny County lying south of the Ohio and Allegheny rivers was included in the vast territory (the limits of which are defined in another chapter of this work) purchased of the Indians at Fort Stanwix (Rome), New York, in 1768. The portion of the county lying north of the rivers was included in the treaty of 1784, also made at Fort Stanwix. By this treaty all the remaining Indian lands (except the Erie Triangle) in Pennsylvania were purchased, which included the territory northwest of the northwestern boundary of the former treaty of Fort Stanwix. On September 24, 1788, Allegheny County was formed from parts of the counties of Westmoreland and Washington, as they were at that time, both of them being further divided later to form other counties. The boundaries of Allegheny County then, however, differed greatly from those of today, as between the date of its formation (1788) and 1800 the following counties were formed from Allegheny, either in whole or in part: Armstrong, Beaver, Butler, Crawford, Erie, Mercer, Warren and Venango.

With this brief outline of Allegheny County, its most important city —and, in fact, the second city of importance in the State—Pittsburg, will be considered.

When George Washington, in the fall of 1753, first visited the site of the future Pittsburg, later called Fort Du Quesne, and continued beyond it to within a few miles of Lake Erie to see the French commandant (being commissioned by Governor Dinwiddie, of Virginia, to ascertain the designs of the French, who were reported to be encroaching on English territory in western Pennsylvania, then regarded as belonging to Virginia) and then returned to Williamsburg, Virginia, he passed through nearly 600 miles of unbroken forest. When he again came in 1770, only a score of dwellings, built of logs, were found to shelter the inhabitants. In 1788 the settlement around Fort Pitt contained about 500 inhabitants, besides the garrison, and had several small retail stores. In the Pittsburg *Gazette* of January 9, 1796, appeared the following item: "The number of inhabitants in the borough of Pittsburg, as taken by the assessors, during the last week, amounts to *one thousand three hundred and ninety-five.*" This is the first authentic account of the population of Pittsburg. The first act for the incorporation of the borough of Pittsburg was passed

April 22, 1794, and the act to incorporate the city of Pittsburg was passed March 18, 1816.

Pittsburg of old was really the first market for the lumber of western Pennsylvania. Even before sawmill days it was a market for hewn timber, which was floated from the headwaters of the Allegheny and its tributaries to that point. At one time the growing town had at least a dozen sawmills. With the increasing scarcity of available timber tributary to the waters of the upper rivers, these gradually disappeared until two or three years ago there was but one sawmill and that was running only intermittently.

The present city of Pittsburg occupies a position in the industrial world which has made the name synonymous with great wealth, prosperity and business "hustle" throughout the world. It has been rightly said that "Pittsburg is the center—the capital—of the greatest industrial empire on the globe." The territory within a radius of seventy-five miles from the Allegheny County courthouse has been termed the "Pittsburg District." This includes a population of over 2,500,000 busy people living in counties under the governments of Ohio, Pennsylvania and West Virginia but so closely allied in industrial pursuits as to be absorbed as part of the Smoky City district. This absorption embraces the active towns of Allegheny, McKeesport, Braddock, Homestead, Beaver, Beaver Falls, New Castle, Sharon, Youngstown, Wheeling, Tarentum and Ford City, whose population and industries contribute to Pittsburg supremacy. Statistics show that in this territory there are 3,300 different kinds of manufactories, employing 250,000 men and operated by capital amounting to $2,000,000,000.

Pittsburg, Allegheny and the immediate suburbs constitute in reality a municipality of more than 1,000,000 people, the fifth center of population in the United States. It is the second city in Pennsylvania in population, manufactures and wealth. It has been prophesied that "in the next generation the Pittsburg District will extend from Wheeling to Morgantown on the rivers, and by the railways east and west to an extent no one can tell."

FIRST SAWMILLS.

There were several sawmills in the vicinity of Pittsburg before the close of the Eighteenth Century. The first one of which record remains was in operation in 1777 and was located fourteen miles above Fort Pitt, on the Monongahela River. It was near this mill that the industry of boatbuilding on western waters had its birth, which industry will be further spoken of later. Two other sawmills, located on the Ohio, were in operation previous to 1786, even at that time one of them being designated "an old mill," and only its remains were then to be seen. Both of

these sawmills are mentioned in an article by Judge Hugh Henry Brackenridge, a prominent citizen of Pittsburg, which appeared in the first number of the Pittsburg *Gazette*.

In the autumn of 1785 the first printing press was carried across the Allegheny Mountains and from it, on July 29, 1786, was printed the first number of the *Gazette*, the earliest newspaper printed west of the Alleghenies. Its publishers were John Scull and Joseph Hall.

The part of Judge Brackenridge's article referring to the sawmills mentioned above is as follows:

> There is a rock known by the name of McKee's rock, at the distance of about three miles below the head of the Ohio. . . . As you ascend the river from these rocks to the town of Pittsburgh, you pass by on your right hand the mouth of a brook known by the name of the Saw-mill run. This empties itself about half a mile below the town, and is overlooked by a building on its banks, on the point of a hill which fronts east, and is first struck by the beam of the rising sun. At a small distance from its mouth is a sawmill,[1] about twenty perches below the situation of an old mill built by the British, the remains of some parts of which are yet seen.

About 1784 Isaac Craig—whose name is a very prominent one in the annals of young Pittsburg—and Stephen Bayard, who were already engaged in the mercantile business, formed a partnership with Turnbull, Marmie & Co., of Philadelphia, and in addition to their original object had a distillery at Pittsburg, a sawmill up the Allegheny and salt works somewhere on the Big Beaver.[2]

As the glass works of Pittsburg have become of world-wide fame, it may not be out of place to give them mention in this work, especially since in this connection light is thrown upon another old sawmill in the territory under consideration. The following is quoted from Craig's "History of Pittsburgh":

> In the spring of the following year [1797], arrangements began to be made by James O'Hara and Isaac Craig for the erection of the first glass works here. William Eichbaum, superintendent of the glass works at the Schuylkill, near Philadelphia, was engaged to direct the erection of the works. As this was an important experiment, the following letter from Major Craig giving an account of the very first movement, may be worth preserving:
>
> "Pittsburgh, June 12th, 1797.
>
> "After your departure, I furnished Mr. Eichbaum with laborers and the necessary tools for digging and probing the hills near the sawmill and up the run as high as the Manor line; considerable time and labor were spent without any other discovery than a stratum of coal from twelve to thirteen inches only. . . . "

The sawmill referred to in the above letter must have been up the run at the upper end of Allegheny City, for in no other direction near Pittsburgh could they have failed to find a vein of coal of a proper depth. The line called the "manor line," was, no doubt, the line of the reserved tract.

[1] This mill continued in use down to 1840 and afterward, according to the "History of Allegheny County," published by A. Warner & Co. in 1889.
[2] "History of Pittsburgh," by Neville B. Craig, 1851.

The "reserved tract" mentioned above is best explained by the following from Craig: "During the Revolution, the Penn family were adherents of the British Government, and in 1779, the Legislature of this State confiscated all their property, except certain manors, etc., of which surveys had been actually made and returned into the land office, prior to the 4th of July, 1776, and also, except any estates which the said Penns held in their private capacities, by devise, purchase or descent. Pittsburgh and the country eastward of it and south of the Monongahela, containing about 5,800 acres, composed one of these manors, and of course remained as the property of the Penns."

THE BOATBUILDING INDUSTRY.

Boatbuilding was at one time an important business at Pittsburg, though it has since greatly declined. It was of early origin in that section, and marked the beginning of that industry in the West—as any territory west of the Alleghenies was then known. Boatbuilding was intimately connected with the lumber trade, not only because wood was the material used, but because boats were in demand for the movement of lumber. The following[1] is a brief account of its beginnings:

In 1777 we hear of the beginning of a new industry here. On February 23 fourteen boat carpenters arrived here from Philadelphia, and were set to work on the Monongahela, fourteen miles above the fort, near a sawmill. There is nothing more definite than this to indicate the spot, but it must have been above Turtle Creek and between that and the mouth of the Youghiogheny. They here built thirty large batteaux, forty feet long, nine feet wide and thirty-two inches deep. These were not very large boats, and would be dignified in these later days with the name of "flats" or "scows," but they were big enough for their purpose, and were adapted to the only system of navigation then in use. They were intended for the transport of troops to invade the Indian country, should it become necessary. Where it was intended to use them does not appear, but probably on the Ohio below Pittsburg. It is only 100 miles from Beaver to Lake Erie, and these light draft batteaux could be propelled some distance up the Beaver; or they may have been intended for transportation to the mouth of the Muskingum or the Scioto, both available as starting points against the Indians; or the purpose may have been to use them for ascending the Allegheny to French Creek, and thence to Lake Erie, Detroit being the objective point. But speculation is useless, as they were never used for either route. In the meantime their construction here may well be considered as the beginning of the business of boatbuilding on the western waters, an industry which not many years afterward attained considerable importance. It is not now much of an industry here, but boats still continue to be built at and near Pittsburg, both wooden and iron, and the armor plate for our warvessels are even now preparing at Pittsburg mills. . . . In the very neighborhood where these batteaux were built coalboats and barges are now built, any one of which would hold a dozen or more of the batteaux of 1777. In the spring of 1778 the commissioners for Indian affairs ordered the building here of six larger boats for the defense of navigation between the military posts on the Ohio. Each boat was to carry a four-pound cannon and to be built so as to be useful either for defense or attack. Compare these four-pound cannon with the monster steel guns now made!

[1] From "History of Allegheny County," published by A. Warner & Co., 1889

GROWTH OF THE LUMBER BUSINESS.

In 1807—just 100 years ago—Pittsburg had four lumber yards.[4] In 1840 it had seventeen lumber yards, having a capital of $167,000 and employing sixty-three men; five sawmills and one oil mill, the value of whose manufactures was $72,000, number of men employed, twenty, capital $49,000; value of ships and vessels built, $43,000. Allegheny City at this time contained nine lumber yards, with a capital of $50,000. The Allegheny lumber trade, now a valuable branch of the business of Pittsburg, was begun in 1795, by Isaac Craig, who purchased a large quantity of boards for the public service from Cornplanter, the Seneca chief, who had a sawmill at Genesadaga (or Genesadego), on the Allegheny, in what is now Warren County.[5]

In 1857 the lumber business of Pittsburg was as follows[6]:

Factories.	Number.	Value of product.
Sawmills	7	$3,241,000
Lumber yards	17	.....
Sash and door factories	8	.....
Planing mills	9	.....
Boatbuilding	..	1,924,800

During the Centennial year—1876—according to the same authority, the following figures tell of the growth of Pittsburg's lumber business as compared with that of nineteen years previous:

Factories.	Number.	Hands.	Total product.
Sawmills and lumber yards	34	291	$1,370,000
Planing mills, etc.	38	821	2,000,000
Carriage and wagon makers	29	400	479,000
Furniture factories	11	300	1,400,000
Coopers and stave dealers	12	340	1,500,000
Stair builders	5	65	70,000
Wood turners	3	20	75,000
Bellows makers	2	8	26,600
Coffin and casket works	2	240	430,000
Match factories	1	27	67,000
Total lumber and products	.....	2,512	7,417,600

According to the *Lumberman's Gazette* of August 29, 1874 (only two years before the time considered in the last table above), Pittsburg then had "forty-two lumber yards and manufactories," and handled 130,000,000 feet of lumber and 30,000,000 shingles annually, nearly all of the latter and a good share of the former being obtained from Michigan. These figures, however, can not be compared with those in the table for 1876, as a number of the thirty-eight planing mills of that table were undoubtedly under the same management as some of the thirty-four

[4] "Allegheny County," by J. W. F. White, 1888.
[5] "A History of American Manufactures," by J Leander Bishop, 1868, Vol. II.
[6] Condensed from Thurston's "Pittsburgh as It Is."

sawmills and lumber yards, and can not be counted as separate establishments without involving duplications.

SOURCES OF SUPPLY.

It was in 1851 that the first scarcity of lumber occurred. Previous to that time the city had been supplied with lumber that came down the rivers in the spring brought chiefly by the merchants who employed the dull months of winter in lumbering to increase their trade. But the spring of '51 brought little lumber upon the early freshets and the active demand soon took all the stock in sight and there was a lumber famine until the floods of November brought more than 100 rafts of lumber down the Allegheny. They were quickly sold by their happy owners and brought higher prices than were ever heard of before in that market, the highest being $18 a thousand feet for clear and $9 a thousand feet for common pine.

The renown of these prices spread along the rivers and there was no scarcity again until the active demands of 1869 more than absorbed all the stock that came down the rivers, and prices climbed to heights that caused builders to hold their breath and wonder where the lumber would come from when the already scant supply on Allegheny waters was gone. But the railroads began to bring lumber into the city and prices were kept within reach of the buyer's purse until the supply of hemlock began to arrive and the prices of building material were again where the people could afford to own their homes.

Then the lumber firms became more of a fixture and many of them remain in the business to this day. Of the earlier firms were Mead & Speer, Huston Bros., Murphy & Diebold and many others who have continued under some style for a score or more years. Many of the operators also established selling offices while their stock lasted, and many new concerns representing lumber supplies from Michigan and the South are in the field, which also attracts the salesmen from all the country who are anxious to sell some of the vast amount that is used annually. The river still brings some lumber down in flat boats, but the chief supply comes by rail from Wisconsin, Minnesota and Canada and from all the yellow pine belt; Pennsylvania supplies the hemlock, oak and maple needed, save for the West Virginia supplies and an occasional carload from the North.

Fir from Washington; redwood from California; cypress from Louisiana, and mahogany from Mexico and Honduras, as well as many varieties of foreign woods for special purposes, are among the daily requisitions of the numerous factories and the shops that supply special work or construct the various and valued implements and fixtures that custom demands shall be of some special material or design. White pine is the great

and unsurpassed material for patterns at the extensive factories and for a great many uses, so that the importation from Canada, as well as shipments from Michigan and Wisconsin, continues unabated and will continue as long as white pine is produced.

LOCAL CONSUMPTION OF LUMBER.

As a lumber center Pittsburg of old and the Pittsburg of today are different propositions. Originally, it was a consuming market pure and simple, but now it has become—and notably so during the last fifteen years—a large wholesaling center in addition to its immense consumptive requirements. The per capita consumptive demand for lumber in this district is believed to be far in excess of that of any other locality in the United States. It seems not only remarkable but incomprehensible that such should be the fact in a community devoted largely to iron and steel production. Nevertheless it is true. A conservative estimate of the annual consumption of lumber in Pittsburg and its immediate vicinity is in the neighborhood of 600,000,000 feet a year. This lumber comprises the entire range of American forest products. The principal items of the trade are white pine and hemlock, followed next by the general range of hardwoods—but poplar, gum, cypress, yellow pine (longleaf, shortleaf and North Carolina) and the Pacific Coast woods form no inconsiderable portion. Preëminently it is a common lumber market, although vast quantities of stock suitable for pattern purposes go into annual consumption. While the producers of iron, steel, glass, chemicals and general miscellaneous manufacturing lines use large quantities of lumber, another large element of consumption is the housebuilding trade. Pittsburg is a vast beehive of workingmen's homes and it is the pride of every laborer to own his own habitation. Blocks of workingmen's houses are constantly being erected and these find ready sale to the frugal manipulators of iron. Pittsburg as a lumber market is particularly distinguished as being the foremost white pine consuming market in the United States. White pine has been its first and constant love.

The following figures show the estimated quantity and value of the lumber consumed by the Pittsburg District for certain years during the last century:

Year.	Quantity, feet.	Value.
1812	7,000,000	$ 70,000
1830	35,000,000	300,000
1850	55,000,000	600,000
1860	75,000,000	1,000,000
1875	115,000,000	3,000,000
1892	300,000,000	8,000,000
1900	700,000,000	20,000,000
1903	.....	30,000,000

The value given for the year 1903 includes lath and shingles also.

There are approximately thirty wholesale lumber dealers in the city of Pittsburg, many of whom are also directly interested in lumber manufacturing enterprises in various parts of the country. While the trade of Pittsburg is not entirely controlled by Pittsburg wholesalers, a large proportion of it is handled through this source. It is safe to say that the wholesalers of Pittsburg, whose trade comprises not only that of Pittsburg proper but extends over a very wide area east and west, north and south, dispose of between 700,000,000 and 800,000,000 feet of lumber annually. This coterie of lumber merchants is made up of men of high character and ample capital and they compare favorably with the most distinguished lumbermen in any part of the country.

From another source is obtained the following rough estimate of the volume of the lumber business of Pittsburg for the year 1906. These figures represent the business done by Pittsburg concerns—not the amount of lumber actually handled in that city:

Variety.	Feet sold in 1906.	Value.
White pine	500,000,000	$15,000,000
Yellow pine	800,000,000	15,400,000
Hemlock	1,000,000,000	20,500,000
Oak and other hardwoods	750,000,000	20,000,000
Spruce	30,000,000	650,000
Pacific Coast woods	15,000,000	500,000
Lath	60,000,000	1,575,000
Shingles	30,000,000	1,050,000
Total	3,185,000,000	$74,675,000

While it is true that Pittsburg is one of the chief lumber centers of the United States and does a constantly increasing business, it is doubtful if that city does one-twelfth of the lumber business of the whole country, as these figures would indicate. Nevertheless, if to the former estimate of between 700,000,000 and 800,000,000 feet of lumber representing the annual wholesale business of the city there be added the retail business—the home consumption, which, in Pittsburg, is very great—and all the outside business in which any Pittsburg lumberman is at all interested, probably the figures would climb far above the billion mark. But though the estimate in the table above may be exaggerated, the fact remains that Pittsburg is one of the leading markets and points of control in the country, doing an immense lumber business and that on an ever-increasing scale. Today that city stands as one of the chief lumber marts of the United States.

PRESENT PITTSBURG HOUSES.

In 1907 about 125 concerns were interested in the lumber business in Pittsburg, including wholesale dealers with or without yards, retail

dealers, lumber manufacturers, sash and door manufacturers and dealers, planing mill operators, box factories, etc.

Among the leading wholesale lumber concerns in Pittsburg are the following: American Lumber & Manufacturing Company, E. V. Babcock & Co., Bemis & Vosburg, Curll & Lytle Lumber Company, Edward Eiler, The Empire Lumber Company, Flint, Erving & Stoner Company, Forest Lumber Company, The Germain Company, D. L. Gillespie & Co., J. M. Hastings Lumber Company, who as the Davidson Lumber Company is engaged in lumber manufacture in Nova Scotia, H. C. Huston Lumber Company, Linehan Lumber Company, The Nicola Lumber Company, William Schuette & Co., A. M. Turner Lumber Company, West Virginia Lumber Company, Willson Bros. Lumber Company.

About twelve Pittsburg houses are lumber manufacturers at other points. Among them are Babcock Bros. Lumber Company, with mills at Babcock, Georgia; Babcock Lumber Company, with mills at Ashtola, Pennsylvania; Cheat River Lumber Company, with mills at Burkeville, Virginia; Curll & Evans Lumber Company, with mills at Holcomb, West Virginia; Florala Saw Mill Company, with mills at Florala, Alabama, and Paxton, Florida; Kendall Lumber Company, with mills at Kendall and Crellin, Maryland; Mead & Speer Company, with mills at Catlettsburg, Kentucky, and at Jennings, Gillespie and Silica, West Virginia; L. L. Satler Lumber Company, with mills at Blackstone, Crewe and Dinwiddie, Virginia; Babcock Boom & Lumber Company, with mills at Davis, West Virginia; Ohiopyle Company, with mills at Ohiopyle, Pennsylvania.

Other institutions of prominence are: L. Benz & Bros., Commercial Sash & Door Company, Diebold Lumber & Manufacturing Company, Eiler Lumber & Mill Company, Edwin M. Hill, Keystone Lumber Company, The F. J. Kress Box Company, R. J. Munhall Lumber Company, H. Murphy Mill & Lumber Company, Pennsylvania Door & Sash Company, and A. & S. Wilson Company.

Of the concerns in the Pittsburg trade list about twenty have their headquarters elsewhere and are represented in Pittsburg by offices. Among them are the following: Advance Lumber Company, Cleveland, Ohio; Alabama Hardwood Lumber Company, Mobile, Alabama; The Farrin-Korn Lumber Company, of Cincinnati, Ohio; M. B. Farrin Lumber Company, of Cincinnati, Ohio; Herman H. Hettler Lumber Company, of Chicago, Illinois; Holland, Graves, Manbert & George, of Buffalo, New York; Paine Lumber Company, manufacturer of sash, doors and blinds, of Oshkosh, Wisconsin; Pittsburg & Southern Veneer Manufacturing Company, of Narrows, Virginia; Red Cliff Lumber Company, of Duluth, Minnesota; Saginaw Bay Company, of Cleveland, Ohio; William

Whitmer & Sons (Incorporated), of Philadelphia, Pennsylvania; Wiley Harker & Camp Company, New York City.

ALLEGHENY CITY CONCERNS.

Leading lumber concerns of Allegheny include the following: Ahlers Lumber Company (not Incorporated), Bruckman Lumber Company, McClure Timber Company, The May Lumber Company, M. Simon's Sons (Limited), H. R. Walter Lumber Company, Willey Bros. and The Munn Lumber Company.

All told, there are about twenty-five concerns in Allegheny engaged in the lumber business, planing mill work, etc.

CHAPTER XXXIX.

PENNSYLVANIA—STATISTICS.

Ever since the first United States census whose report regarding the lumber industry was at all accurate enough to be of any value (that of 1840), Pennsylvania has occupied one of the first three positions in value of products, until the census of 1900, when it took fourth rank. In 1840 Pennsylvania ranked third; in 1850, second; in 1860, first; in 1870, second; in 1880, second; in 1890, third, and in 1900, fourth. In the number of establishments Pennsylvania ranked as follows according to the different censuses: In 1840, second; in 1850, second; in 1860, first; in 1870, first; in 1880, first; in 1890, second, and in 1900, first. Such a record of endurance is encouraging as to the future.

Lumbering has been going on in this State since very early days, although New England and New York doubtless had sawmills a quarter of a century previous, as Pennsylvania's earliest mills date from about the middle of the Seventeenth Century. The topography of Pennsylvania, as well as its immense wealth of forests, favored the prosecution of lumbering. In the eastern and central part of the State are the Susquehanna, the West Branch, the Delaware, the Schuylkill, the Lehigh and all their numerous tributaries; in the western part are the Allegheny, the Monongahela, the Ohio and their many branches. Such a wealth of navigable streams afforded excellent opportunities for the transportation of logs and lumber before the day of the railroads, and Pennsylvania's lumber early found its way as far as the Atlantic ports, by way of the Delaware and the Susquehanna, and as far as New Orleans, by way of the Ohio and the Mississippi.

In the following table the different items making up the lumber report are compared for the census years from 1850 to 1900. Prior to 1850 the figures obtained for the lumber industry are too incomplete to admit of comparison. By a glance at this table it will be seen that, despite the extravagant use of Pennsylvania's forest wealth, that State still maintains a lumber manufacturing industry of no mean proportions, and the figures for 1900 in nearly all the items are larger than those of any of the other years.

The comparison of the last six decades, as to number of establishments, capital invested, number of employees, wages, cost of materials used and the value of products, is as follows:

COMPARATIVE LUMBER STATISTICS, 1850–1900—PENNSYLVANIA.

	1850.	1860.	1870.	1880.	1890.[1]	1900.[1]
Number of establishments	2,894	3,078	3,739	2,827	1,948	2,338
Capital	$6,913,267	$10,978,464	$24,804,304	$21,418,588	$45,107,300	$47,832,548
Number of wage-earners	7,052	9,419	17,427	14,914	19,598	20,359
Wages	$1,787,520	$2,485,103	$5,261,576	$2,918,459	$5,440,480	$8,312,776
Cost of materials used	$3,869,558	$5,211,990	$14,940,096	$13,955,430	$15,677,103	$14,408,076
Value of products	$7,729,058	$10,994,060	$28,938,985	$22,457,359	$29,087,970	$35,749,965

[1]Prior to 1890 the reports of "timber camps" were not taken, but have been included with the figures of the other branches of the industry for 1890 and 1900.

The complete report on lumber products, as given in the census of 1900, for Pennsylvania is given below. The classifications are as follows: Rough lumber—including conifers and hardwoods—shingles, cooperage materials, other sawed products, timber camp products and planing mill products, the quantity and value of each item under these heads being given. According to these figures the grand total of Pennsylvania's forest products in the year 1899 (which was the year covered by the 1900 census) had a value of $34,713,555, surpassed by only three states.

FOREST PRODUCTS OF PENNSYLVANIA—CENSUS OF 1900.

ROUGH LUMBER.

	Quantity, feet b. m.	Value.
CONIFERS:		
Yellow pine	17,901,000	$ 217,975
White pine	221,047,000	3,274,183
Hemlock	1,558,188,000	16,299,753
Spruce	3,423,000	51,375
All other conifers	563,000	62,000
Total, conifers	1,801,122,000	$19,905,286
HARDWOODS:		
Ash	4,677,000	$ 80,021
Birch	10,266,000	128,186
Chestnut	44,614,000	569,764
Cottonwood	40,000	600
Elm	2,619,000	32,265
Gum	50,000	455
Hickory	4,273,000	79,317
Basswood	10,073,000	134,334
Oak	342,268,000	5,001,313
Poplar	10,364,000	165,472
Black walnut	376,000	14,019
Maple	49,650,000	624,516
Other hardwoods	40,892,000	568,320
Total, hardwoods	520,162,000	$7,398,582
Total, rough lumber	2,321,284,000	$27,303,868

SHINGLES.

	Quantity, pieces.	Value.
White pine	84,872,000	$225,591
Cedar	2,735,000	7,215
Hemlock	250,320,000	527,554
Spruce	10,000	50
All hardwoods	31,921,000	106,025
Total, shingles	369,858,000	$866,435

COOPERAGE MATERIALS.

	Quantity.	Value.
Hoops, pieces	75,000	$ 430
Staves, pieces	145,353,000	589,606
Headings, sets	7,243,044	173,517
Total, cooperage materials	.....	$763,553

OTHER SAWED PRODUCTS.

Bobbin and spool stock, feet b. m.	50,000	$ 774
Furniture stock, feet b. m.	4,652,000	77,086
Agricultural implement stock, feet b. m.	725,000	13,900
Carriage and wagon stock, feet b. m.	1,568,000	30,936
Pickets and palings, feet b. m.	4,845,000	47,854
Lath, pieces	266,949,000	584,353
All other sawed products	.....	688,516
Total, other sawed products	.....	$1,443,419

TIMBER CAMP PRODUCTS.

Basket stock, cords	100	$ 250
Cooperage stock, cords	6,335	12,122
Excelsior stock, cords	1,950	6,607
Fence posts, pieces	253,318	23,849
Hop poles, pieces	39,300	295
Hewed timber, feet b. m.	6,728,000	87,781
Logs cut for export, feet b. m.	3,071,000	28,050
Logs cut for domestic sale, feet b. m.	118,534,000	759,983
Handle stock, cords	203	3,076
Hemlock bark, cords	330,633	1,341,767
Oak bark, cords	14,384	69,865
Piles, pieces	36,564	61,902
Railway ties, pieces	1,394,500	473,091
Rived or shaved shingles, pieces	199,000	779
Telegraph poles, pieces	32,647	63,380
Charcoal, bushels	597,170	35,896
All other products	.....	324,291
Amount received for contract work	.....	79,616
Total, timber camp products	.....	$3,372,600
Total, planing mill products	$3,860,589	
Less value of lumber used	2,896,909	$963,680
Grand total, value of forest products	.....	$34,713,555

In the total quantity of conifers cut, which in Pennsylvania amounted to 1,801,122,000 feet, this State was surpassed by only three others—Wisconsin, Minnesota and Michigan—and that in the face of the fact that Pennsylvania's conifers have been gradually diminishing by the lumberman's ax for the last 250 years, while in the other three states the denuding process has been going on for less than 100 years. In total quantity of hardwoods cut Pennsylvania was surpassed by Indiana, Ohio, Tennessee, Michigan, Kentucky and West Virginia, in the order named; but all of these states, with the exception of Michigan, are hardwood states. In total quantity of shingles manufactured the following states ranked ahead of Pennsylvania: Washington, Michigan, Wisconsin, California, Louisiana, Minnesota and Maine. In total value of cooperage materials Tennessee, Michigan, Indiana, Arkansas, Ohio, Kentucky and Wisconsin were in advance of Pennsylvania. In the value of "other sawed products" Pennsylvania ranked seventh, Michigan, Wisconsin, Indiana, Ohio, Maine and Massachusetts being in the lead. In the total value of planing mill products the Keystone State was surpassed by Wisconsin, Minnesota, Arkansas, Michigan, Texas, Washington, Louisiana and California, and in the total value of timber camp products this State stood fourth, Washington, Michigan and Minnesota ranking ahead of it.

The next table of figures is a comparative summary of Pennsylvania's

lumber and timber products for the years 1899, 1904 and 1906 as shown by the censuses of 1900, 1905 and 1907. It will be observed that the 1900 figures in this table do not coincide with the figures in the preceding table for the same year, which is due to the fact that the census of 1905 did not include custom mills, and consequently, in order to make the comparison, the custom mills were taken out of the figures for 1900. The table is as follows:

CENSUS OF MANUFACTURES.

LUMBER AND TIMBER PRODUCTS—PENNSYLVANIA.

Comparative Summary—1900, 1905 and 1907.

	1900.	1905.	1907.
Number of establishments	1,672	11,212	(2)
Capital	$28,450,008	[1]$22,677,322	(2)
Salaried officials, clerks, etc.:			
Number	577	592	(2)
Salaries	$481,115	$584,194	(2)
Wage-earners:			
Average number	22,671	116,674	(2)
Wages	$9,147,924	[1]$7,959,875	(2)
Miscellaneous expenses	$3,420,436	$5,749,729	(2)
Cost of materials used[3]	$14,177,091	[1]$12,142,355	(2)
Value of products[3]	$35,031,908	[1]$33,779,240	(2)
Quantity, Value[4] and Principal Varieties of Rough Lumber:			
White pine:			
Thousand feet b. m	201,491	123,726	96,564
Value	$3,043,019	$2,244,056	.....
Hemlock:			
Thousand feet b. m.	1,523,890	1,166,712	966,480
Value	$15,932,573	$14,756,750	.....
Spruce:			
Thousand feet b. m.	3,248	6,419	2,428
Value	$49,400	$90,499	.....
Yellow pine:			
Thousand feet b. m.	17,160	4,571	34,063
Value	$209,233	$68,619	.....
Birch:			
Thousand feet b. m.	10,145	14,131	25,583
Value	$125,138	$279,025	.....
Chestnut:			
Thousand feet b. m.	39,030	61,167	73,096
Value	$499,628	$847,896	.....
Oak:			
Thousand feet b. m.	312,056	232,718	243,110
Value	$4,572,104	$4,057,493	.....
Poplar:			
Thousand feet b. m.	9,575	7,050	5,304
Value	$154,226	$123,539	.....
Maple:			
Thousand feet b. m.	48,171	57,834	75,081
Value	$606,246	$1,057,016	.....
Elm:			
Thousand feet b. m.	2,428	5,754	5,635
Value	$30,525	$113,743	.....
All other:			
Thousand feet b. m.	70,540	58,890	93,537
Value	$1,081,396	$935,971	.....
Total quantity, thousand feet b. m.	2,237,734	1,738,972	1,620,881
Total value	$26,303,488	$24,574,607	.....

[1]Decrease.

[2]No figures given for these items in the 1907 census.

[3]Includes a duplication—the value of rough lumber, which in 1900 amounted to $2,136,850, remanufactured in planing mills connected with sawmills producing it.

[4]Values not given in the 1907 census.

The above figures are not absolutely correct, as it is impossible, even for the census, to get returns from all mills. As illustrating this, the figures representing the cut for the year 1904 were the returns from 18,277 mills,

for the whole United States, and those for 1906 were from 21,077 mills. The figures for 1905 are not given, for the reason that only 11,666 mills reported for that year, and, consequently, the figures are not representative of the magnitude of the industry, as they include reports from only about fifty percent of the operators. The figures for 1904 were compiled by the Bureau of the Census, and those for 1906 by the Bureau with the assistance of the Forest Service.

By reference to the table it will be seen that the total quantity of rough lumber cut in Pennsylvania has steadily declined since 1900. Generally speaking, the conifers have shown a decrease, while the hardwoods have shown an increase. The quantity of white pine and hemlock cut shows a steady decrease for the three years given in the table; birch, chestnut and maple show a steady increase; spruce, yellow pine, oak and elm show a fluctuation, while poplar is the only hardwood that shows a steady decrease through the years. In the item "All other" is included the following species: Red pine, the cedars, the junipers, ash, cottonwood, gum, hickory, basswood, black walnut, sycamore, beech and a few others of very minor importance, in fact, all species included under the heading "All other" are of minor importance in point of quantity.

TIMBER USED IN COAL MINES IN 1905.

Comparatively few persons consider the immense amount of timber which is used underground in the large mining industries of the United States. As Pennsylvania is by far the heaviest coal producer of all the states of the Union, and as its mines supply nearly all the anthracite coal, which requires in getting out a much larger quantity of timber for pillars and lagging than is used in the bituminous mines, the consumption for timber in the coal mines of the State is worthy of special mention. Not only is an enormous quantity used in the form of pillars and lagging, but a further demand is created by the mining industry for outside work, to say nothing of the construction of houses for workmen. The Forest Service and the United States Geological Survey have coöperated to secure statistics in regard to the total amount used in the year 1905.

The figures for the anthracite coal industry of Pennsylvania show that reports were received from 216 collieries, producing approximately 83 percent of the total anthracite tonnage of the United States, and estimates were computed for the remaining 17 percent, using as a basis the reports received.

So far as reported, the kinds of wood have been tabulated separately, but in many cases the operators were unable to furnish information in regard to the quantity of each species used, and it has, therefore, been necessary to classify a large amount as "Mixed" or "Miscellaneous."

The figures showing the amount of both round and sawed timber used in 1905 are as follows:

TIMBER USED BY MINES.

Kind.	Round timber, cubic feet.	Sawed timber, feet b. m.
Yellow pine	9,250,000	14,200,000
Oak	6,220,000	2,860,000
Hemlock	1,180,000	63,600,000
Pitch pine	590,000	84,000
Chestnut	444,000	.....
Beech	236,000	.....
Jack pine	165,000	.....
Spruce	115,000	371,000
Maple	.....	1,740,000
White pine	.....	328,000
Mixed hardwoods	10,263,000	28,642,000
Mixed softwoods	477,000	1,370,000
Miscellaneous	23,500,000	8,370,000
Total	52,440,000	121,565,000

Of the species used for round timber, yellow pine, of which a large amount is loblolly pine from the South, stands first. Oak ranks next, but furnishes a much smaller proportion according to the reports. Oak would unquestionably be increased if the large items reported as "Mixed hardwoods" and "Miscellaneous" could be separated into species, and it is not improbable that it would then displace pine in rank.

In sawed timber, hemlock holds first place in quantity, while yellow pine ranks next. The amount of oak reported is, doubtless, too small, but an explanation is found in the classification for "Mixed hardwoods" and "Miscellaneous," which contain over 37,000,000 feet board measure, of which probably a large amount is oak.

The results of the tabulations show that 121,565,000 feet board measure of sawed timber (equivalent to 10,130,000 cubic feet) and 52,440,000 cubic feet of round timber were used during 1905.

The total value of the sawed timber was $1,842,000, or $15 a thousand feet board measure. The total value of the round timber was nearly double that of the sawed timber, being $3,468,000, or $6.60 a hundred solid cubic feet—the approximate equivalent of the average standard cord of 128 cubic feet. The total value of the round and sawed timber combined was $5,310,000, or about eight and one-half cents per long ton of coal mined, using as a basis for the calculation the production in 1905 in round numbers, 61,000,000 long tons.

SOME OF THE PENNSYLVANIA SAWMILLS.

The next table shows the cut of a few of the most prominent of Pennsylvania's mills, arranged alphabetically according to towns and giving the name of the owner. Only mills having a cut of 3,000,000 feet or over

are included. These figures are taken from the statistics compiled annually by the *American Lumberman*, and, while they are representative of the industry, should not be taken as complete, for they represent only those mills reporting. Nevertheless, this publication will preserve the names of some of the Pennsylvania lumber producers of 1906, with their cut, by species, during that year:

MILLS CUTTING 3,000,000 FEET OR OVER—PENNSYLVANIA, 1906.

Location and Owner.	White pine, ft.	Hemlock, feet.	Oak, feet.	Basswood, feet.	Birch, feet.
Allendale—A. P. Perley	.....	10,000,000	500,000	400,000	75,000
Allisonia—Averill & Son Lumber Co	8,000,000	.....	.....	.....	.....
Aspah—Campbell & Hagenbuch	556,000	15,829,000	200,000	169,000	506,000
Ashtola—Babcock Lumber Company	.....	.....	2,000,000	200,000	200,000
Mill at Arrow	300,000	35,000,000	.....	500,000	.....
Austin—Goodyear Lumber Company	.....	72,000,000	.....	.....	.....
Mill at Galeton	.....	92,370,000	.....	.....	.....
Mill at Medix Run	.....	49,861,000	.....	.....	.....
Carbon Black—Webster Keasey	.....	.....	.....	.....	.....
Chapmans Run—Reuben Miller	1,000,000	.....	8,000,000	.....	.....
Cresson—Meixel, Coleman & Co	.....	1,500,000	.....	.....	.....
Mill at Curwensville	1,000,000	3,500,000	.....	.....	.....
Cross Fork—Lackawanna Lumber Co	3,000,000	46,917,000	700,000	2,589,000	1,295,000
Eagle Rock—Crandin Lumber Company	5,600,000	1,844,000	1,152,000	.....	.....
Ebensburg—Webster Griffith	.....	1,500,000	.....	.....	.....
Emporium—C. B. Howard Company	33,000	13,294,000	17,000	38,000	66,000
Endeavor—Wheeler & Dusenbury	8,000,000	10,000,000	.....	.....	.....
Glen Union—Glen Union Lbr. Co., Ltd	3,072,000	65,000	261,000	.....	2,000
Frenchville—Deer Creek Lumber Co	2,000,000	3,000,000	.....	.....	.....
Hicks Run—John E. DuBois	278,000	44,319,000	1,258,000	28,000	217,000
Keating Summit—Emporium Lumber Co. (including mill at Austin, also)	500,000	150,000	1,000,000	1,250,000	1,400,000
Kellettville—Salmon Creek Lumber Co	7,000	8,313,000	41,000	.....	8,000
Second mill, new	90,000	12,225,000	43,000	63,000	32,000
Knoxville—I. M. Edgecomb's Sons	700,000	2,000,000	.....	.....	.....
Kushequa—Elisha Kent Kane	.....	2,766,000	.....	.....	.....
Mill at Kane	.....	2,118,000	.....	.....	.....
Laquin—Laquin Lumber Company	10,000	33,259,000	.....	.....	50,000
Laurel Mills—Hyde & Thayer	.....	11,000,000	.....	.....	.....
Mahaffey—Snyder Run Lumber Co	4,000,000	1,000,000	.....	.....	.....
Mahaffey—Woodman Lumber Company	200,000	2,000,000	175,000	.....	.....
Marienville—W. T. Hart & Co	.....	3,000,000	100,000	.....	.....
Mayburg—Watson Lands Lumber Co	2,258,000	8,268,000	.....	.....	.....
Millstone—Bells Bros	.....	2,000,000	.....	.....	.....
Nebraska—Collins, Darrah & Co	1,004,000	3,063,000	.....	.....	.....
New Millpond—Columbia Lumber Co	600,000	1,800,000	400,000	150,000	.....
Outcrop—H. C. Huston Lumber Co	.....	200,000	4,000,000	50,000	.....
Pittsburg—Monongahela River Consolidated Coal & Coke Co	976,000	4,000,000	800,000	.....	.....
Port Royal—H. C. Hower & Bro	500,000	.....	3,000,000	.....	.....
Rexis—Vinton Lumber Company, Ltd	207,000	8,686,000	686,000	110,000	98,000
Rutherton—Laurelton Lumber Co	1,197,000	2,178,000	736,000	.....	.....
St. Marys—Kaul & Hall Lumber Co	.....	40,000,000	.....	.....	.....
Shippinsville—J. M. McLaughlin & Co	500,000	.....	2,000,000	.....	.....
Sinnamahoning—Barclay Bros	1,047,000	4,542,000	.....	.....	.....
Slate Run—James B. Weed & Co	868,000	19,312,000	.....	.....	.....
Straight—T. H. Quinn & Co	.....	15,995,000	.....	.....	.....
Union City—Caflish Bros	100,000	500,000	.....	150,000	10,000
White Deer—White Deer Lumber Co	874,000	753,000	137,000	95,000	.....
Williamsport—Bowman-Foresman Co	4,200,000	7,200,000	300,000	.....	.....
Williamsport—Brown, Clark & Howe	86,000	24,864,000	69,000	59,000	.....
Williamsport—Central Pa. Lumber Co	200,000	13,024,000	100,000	50,000	.....
Mill at Grays Run	20,000	18,856,000	.....	.....	30,000
Mill at Jamison City	37,000	8,895,000	254,000	41,000	239,000
Mill at Leetonia	.....	10,405,000	.....	.....	.....
Mill at Loleta	.....	34,700,000	.....	.....	.....
Mill at Mina	.....	20,984,000	50,000	100,000	300,000
Mill at Trout Run	.....	683,000	.....	.....	.....
Williamsport—C. W. Sones	.....	6,000,000	.....	.....	.....
Wyalusing—M. H. & G. H. Welles Lumber Company	2,700,000	250,000	412,000	10,000	6.000

MILLS CUTTING 3,000,000 FEET OR OVER—PENNSYLVANIA, 1906—Continued.

Location and Owner.	Elm, feet.	Chestnut, feet.	Beech, feet.	Other hdws., ft.	Total, feet.
Allendale—A. P. Perley	.....	1,800,000	2,000,000	1,000,000	15,775,000
Allisonia—Averill & Son Lumber Co	.....	.....	.....	.....	8,000,000
Aspah —Campbell & Hagenbuch	5,000	155,000	205,000	600,000	18,225,000
Ashtola—Babcock Lumber Company	.....	2,000,000	4,000,000	8,000,000	16,400,000
Mill at Arrow	.....	.....	.....	.....	35,800,000
Austin—Goodyear Lumber Company	.....	.....	.....	.....	72,000,000
Mill at Galeton	.....	.....	.....	.....	92,370,000
Mill at Medix Run	.....	.....	.....	.....	49,861,000
Carbon Black—Webster Keasey	.....	.....	.....	4,000,000	4,000,000
Chapmans Run—Reuben Miller	.....	.....	.....	.....	9,000,000
Cresson—Meixel, Coleman & Co	.....	.....	.....	1,000,000	2,500,000
Mill at Curwensville	.....	.....	.....	1,000,000	5,500,000
Cross Fork—Lackawanna Lumber Co	1,295,000	1,459,000	6,475,000	4,970,000	68,700,000
Eagle Rock—Crandin Lumber Company	.....	.....	.....	737,000	9,333,000
Ebensburg—Webster Griffith	.....	.....	.....	2,000,000	3,500,000
Emporium—C. B. Howard Company	.....	.....	3,296,000	1,852,000	18,596,000
Endeavor—Wheeler & Dusenbury	1,000,000	.....	.....	.....	[1]20,000,000
Glen Union—Glen Union Lbr. Co., Ltd	.....	3,000	.....	186,000	3,589,000
Frenchville—Deer Creek Lumber Co	.....	.....	.....	2,000,000	7,000,000
Hicks Run—John E. DuBois	.....	475,000	723,000	.....	47,298,000
Keating Summit—Emporium Lumber Co. (including mill at Austin, also)	50,000	1,000,000	2,500,000	8,000,000	15,850,000
Kellettville—Salmon Creek Lumber Co	.....	2,000	809,000	220,000	9,400,000
Second mill, new	.....	25,000	.....	67,000	12,545,000
Knoxville—I. M. Edgecomb's Sons	.....	.....	.....	1,500,000	4,200,000
Kushequa—Elisha Kent Kane	.....	.....	.....	4,762,000	7,528,000
Mill at Kane	.....	.....	.....	616,000	2,734,000
Laquin—Laquin Lumber Company	.....	.....	50,000	50,000	33,419,000
Laurel Mills—Hyde & Thayer	.....	.....	.....	.....	11,000,000
Mahaffey—Snyder Run Lumber Co	.....	.....	.....	2,000,000	7,000,000
Mahaffey—Woodman Lumber Company	.....	.....	.....	1,000,000	3,375,000
Marienville—W. T. Hart & Co	.....	100,000	300,000	100,000	3,600,000
Mayburg—Watson Lands Lumber Co	.....	.....	.....	3,156,000	13,682,000
Millstone—Bells Bros	.....	.....	.....	400,000	2,400,000
Nebraska—Collins, Darrah & Co	.....	.....	.....	1,435,000	5,502,000
New Millpond—Columbia Lumber Co	.....	100,000	25,000	600,000	3,675,000
Outcrop—H. C. Huston Lumber Co	.....	500,000	.....	200,000	4,950,000
Pittsburg—Monongahela River Consolidated Coal & Coke Co	.....	.....	.....	.....	5,776,000
Port Royal—H. C. Hower & Bro	.....	300,000	.....	450,000	4,250,000
Rexis—Vintou Lumber Company, Ltd	.....	48,000	20,000	3,857,000	13,712,000
Rutherton—Laurelton Lumber Co	.....	.....	.....	.....	[2]4,698,000
St. Marys—Kaul & Hall Lumber Co	.....	.....	.....	.....	40,000,000
Shippinsville—J. M. McLaughlin & Co	.....	100,000	.....	100,000	2,700,000
Sinnamahoning—Barclay Bros	.....	.....	.....	410,000	5,999,000
Slate Run—James B. Weed & Co	.....	.....	.....	2,140,000	22,320,000
Straight—T. H. Quinn & Co	.....	.....	.....	150,000	16,145,000
Union City—Caflish Bros	100,000	25,000	1,000,000	1,500,000	3,385,000
White Deer—White Deer Lumber Co	.....	1,000,000	135,000	830,000	3,824,000
Williamsport—Bowman-Foresman Co	.....	.....	.....	.....	11,700,000
Williamsport—Brown, Clark & Howe	.....	61,000	.....	124,000	25,263,000
Williamsport—Central Pa. Lumber Co	.....	350,000	.....	87,000	13,811,000
Mill at Grays Run	.....	.....	30,000	10,000	18,946,000
Mill at Jamison City	.....	97,000	.....	97,000	9,660,000
Mill at Leetonia	.....	.....	.....	36,000	10,441,000
Mill at Loleta	.....	.....	.....	179,000	34,879,000
Mill at Mina	10,000	20,000	200,000	349,000	22,013,000
Mill at Trout Run	.....	.....	.....	.....	683,000
Williamsport—C. W. Sones	.....	.....	.....	2,500,000	8,500,000
Wyalusing—M. H. & G. H. Welles Lumber Company	.....	19,000	40,000	180,000	3,617,000

[1]Includes 1,000,000 feet of spruce.
[2]Includes 587,000 feet of spruce.

EXPORTS AND IMPORTS.

Pennsylvania has, from the earliest times, been an exporter of products of the forest. As early as William Penn's time boards, deals, planks, scantling, staves, etc., were shipped down the Delaware from Philadelphia to the West Indies and to England, but, unfortunately, the early

records are very meager. We learn, however, that in 1765 783,000 feet of boards and scantling was exported from Philadelphia, at £2,470, as money was reckoned then; during the same year shingles, staves and heading to the value of £28,450 were exported. In 1772, 1,724,000 feet of boards and planks was exported; in 1773, 4,075,000, and in 1774, 3,309,000 feet. Available government records begin with 1856, and for Philadelphia are as follows:

EXPORTS FROM PHILADELPHIA.

Year.	Unmanufactured.					Manufactured.		
	Logs and other timber.	Sawed lumber.		Shooks, staves and headings.	All other unmanufactured.	Furniture.	Hogsheads and barrels.	All other manufactures.
	Value.	Feet.	Value.	Value.	Value.	Value.	Value.	Value.
1856	.....	1,569,000	$27,741	$ 2,018	$ 1,848	$ 24,684	.....	$164,579
1857	.....	1,547,000	27,706	601	3,417	21,466	.....	209,958
1858	.....	3,012,000	46,901	2,749	771	24,274	.....	193,578
1859	.....	2,903,000	46,228	2,885	16,222	23,595	.....	253,983
1860	.....	2,535,000	40,122	480	18,837	16,212	.....	359,874
1861	.....	3,457,000	59,533	820	15,317	15,321	.....	420,155
1862	.....	2,120,000	31,249	287,698	23,270	7,132	.....	131,670
1863	[1]$ 3,280	2,268,000	47,874	448,271	50,062	9,236	.....	151,104
1864	[1]460	3,184,000	107,688	540,269	153,642	13,444	$ 4,863	6,232
1865	1,338	2,440,000	87,453	564,853	287,978	12,426	2,409	10,275
1867	2,154	2,853,000	77,307	683,827	267,263	4,249	26,121	18,672
1868	200	2,700,000	67,808	769,878	283,811	16,077	49,089	8,410
1869	122,500	1,390,000	36,384	731,979	16,964	5,050	.....	118,335
1870	229,008	4,116,000	89,002	601,372	3,554	3,181	60,973	3,420
1871	302,079	4,422,000	93,199	613,189	410	6,569	84,413	55,684
1872	183,859	2,351,000	62,249	524,787	3,954	8,588	77,499	5,262
1873	232,230	1,346,000	38,603	468,919	2,726	3,357	97,329	2,827
1874	391,280	3,544,000	103,596	528,565	8,969	2,613	123,383	24,841
1875	218,678	5,219,000	106,528	369,112	147	11,431	173,406	19,114
1876	250,880	2,993,000	57,030	323,018	1,071	7,407	149,259	49,874
1877	194,882	5,932,000	110,975	320,999	1,104	13,053	81,643	50,013
1878	181,047	8,205,000	132,405	278,667	38,676	5,857	76,444	62,632
1879	236,362	5,938,000	103,011	312,286	9,679	11,467	116,202	11,793
1880	207,819	3,940,000	70,910	291,651	6,659	10,466	115,001	8,051
1881	17,260	2,753,000	58,981	303,345	127,129	48,856	62,212	28,507
1882	6,655	4,051,000	84,684	211,080	158,566	20,487	126,252	8,667
1883	9,130	3,921,000	81,187	223,810	160,248	7,940	112,901	20,016
1884	26,620	2,597,000	50,932	259,870	105,081	13,759	118,300	9,690
1885	2,507	1,469,000	25,658	246,809	101,127	15,191	135,232	18,563
1886	4,745	3,034,000	59,485	251,047	66,493	12,756	251,590	15,376
1887	8,750	2,754,000	19,357	164,703	96,487	14,184	243,305	34,157
1888	37,450	495,000	9,466	176,663	71,874	29,729	210,753	14,605
1889	27,585	305,000	5,420	184,671	50,923	8,369	171,106	17,069
1890	[2]37,343	264,000	7,764	229,834	63,641	17,079	185,814	40,369
1891	46,728	174,000	4,324	144,461	190,749	30,963	88,543	33,890
1892	14,909	188,000	3,810	182,532	192,634	31,677	41,101	68,697
1893	61,921	1,080,000	17,876	174,251	180,172	29,804	8,079	64,151
1894	31,182	197,000	5,148	146,740	147,598	21,531	19,776	39,463
1895	34,761	81,000	1,638	130,678	113,278	45,620	21,258	123,169
1896	23,062	.....	.....	123,135	150,485	64,417	45,554	230,492
1897	33,541	.....	.....	70,907	198,493	85,612	89,165	235,580
1898	34,919	2,495,000	38,069	68,615	165,677	52,061	82,274	239,450
1899	51,149	765,000	16,539	69,844	229,582	66,339	45,269	246,268
1900	97,565	324,000	7,184	87,557	259,360	94,236	1,552	318,774
1901	131,136	1,829,000	46,446	104,952	386,268	77,486	4,096	294,506
1902	96,091	1,946,000	33,663	126,017	370,124	70,411	4,362	582,232
1903	68,847	3,648,000	58,275	111,293	447,283	67,773	6,505	469,421
1904	107,533	14,785,000	323,728	65,936	186,917	88,309	22,418	521,775
1905	104,701	16,600,000	340,741	120,234	367,998	78,128	3,818	484,043

[1]Includes hewn timber.
[2]Includes sawed timber.

Philadelphia's imports have never been as heavy as its exports, although there was a time—about the beginning of the Nineteenth Century—when that city was the leading point of importation in the United States. But receipts of foreign woods at this port have decreased until now several cities exceed Philadelphia in this respect. General lumber importations have always been light, cabinet woods, cabinet ware, furniture and other manufactures of wood forming the bulk of the imports. The values of imports from 1856 to 1905, inclusive, at the port of Philadelphia, were as shown in the following table:

IMPORTS AT PHILADELPHIA.

Year	Unmanufactured.			Manufactured.	
	Cabinet woods.	All lumber.	All other unmanufactured.	Cabinet ware and furniture.	All other manufactures.
	Value.	Value.	Value.	Value.	Value.
1856	$11,397	.....	$ 8	$ 234	$ 7,874
1857	8,860	.....	79	.....	15,299
1858	6,176	.....	84	20	13,764
1859	7,885	.....	.....	.....	13,321
1860	3,357	.....	.....	70	10,419
1861	13,386	.....	.....	252	8,321
1862	456	.....	31	1,160	1,099
1863	2,694	.....	.....	453	.....
1864	18,729	.....	.....	.....	.....
1865	35,675	.....	1,650	988	.....
1868	11,146	$27,778	8,008	5,206	.....
1869	9,377	.....	.....	.....	362,790
1870	1,833	.....	.....	.....	362,527
1871	20,312	44,225	.....	210,604	.....
1872	21,177	38,403	.....	211,121	.....
1873	.....	18,685	123,011	234,683	.....
1874	.....	19,515	111,348	244,118	.....
1875	.....	21,007	17,720	231,699	.....
1876	.....	24,945	16,616	261,623	.....
1877	.....	4,262	110,733	2102,022	.....
1878	.....	634	11,814	238,632	.....
1879	.....	12,012	112,187	241,578	.....
1880	.....	11,801	118,318	258,581	.....
1881	.....	11,416	19,324	268,803	.....
1882	.....	14,418	138,989	275,804	.....
1883	.....	16,365	147,435	275,611	.....
1884	.....	39,615	151,509	6,806	51,132
1885	.....	21,222	151,107	13,900	56,741
1886	.....	20,869	141,765	5,647	44,773
1887	.....	14,193	121,971	19,613	52,123
1888	.....	20,494	132,885	26,069	26,144
1889	.....	10,919	118,223	16,605	26,468
1890	.....	18,983	118,003	23,638	144,836
1891	.....	8,358	122,021	19,720	146,919
1892	.....	7,279	110,349	9,995	150,529
1893	.....	19,299	133,548	18,433	236,568
1894	.....	13,015	138,638	3,291	188,213
1895	38,520	2,905	49,146	2,006	131,514
1896	10,993	.....	70,969	1,607	98,505
1897	8,264	.....	59,710	3,380	91,434
1898	21,937	2,557	25,118	3,593	60,700
1899	16,610	7,945	19,073	1,292	50,931
1900	14,202	42,456	29,534	6,909	123,160
1901	11,237	16,637	29,395	3,594	146,134
1902	13,565	8,323	43,001	10,902	249,658
1903	2,720	103,170	72,944	10,040	361,969
1904	29,262	108,497	64,215	15,025	389,408
1905	49,549	74,311	49,158	13,568	345,905

[1]Includes all unmanufactured wood not otherwise specified.
[2]Includes all manufactures of wood.
[3]Includes all wood and manufactures of wood except cabinet woods.

The exports and imports of Pennsylvania's minor ports are, compared with those of Philadelphia, very insignificant. So unimportant are these figures that the total for the entire period covered by the Government figures—1856 to 1905, inclusive—is grouped together in one sum in the following table:

MINOR PORTS OF PENNSYLVANIA—1856–1905.

Ports.	Unmanufactured.		Manufactured.	
	Sawed lumber, value.	All other unmanufactured, value.	Cabinet ware and furniture, value.	All other manufactures, value.
		EXPORTS.		
Erie	$278	$406	$2,259	$5,584
		IMPORTS.		
Erie	$182,634	$295,059	$ 9,768	$ 7,331
Pittsburg	.....	2,354	28,572	82,185

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